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THESIS

ON THE

NATURE AND HISTORY OF PLAGUE,

AS OBSERVED IN THE

NORTH WESTERN PROVINCES OF INDIA.

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BY

FREDERICK FORBES, A.M., M.D.,



EDINBURGH:

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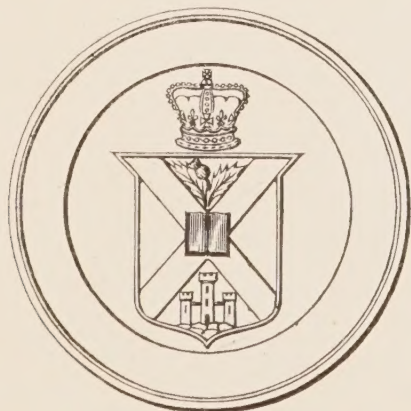


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THESIS  
ON THE  
NATURE AND HISTORY OF PLAGUE,  
AS OBSERVED IN THE  
NORTH WESTERN PROVINCES OF INDIA,  
FOR WHICH A GOLD MEDAL WAS AWARDED  
BY THE  
FACULTY OF MEDICINE OF THE UNIVERSITY  
OF EDINBURGH.  
TO WHICH ARE ADDED,  
REMARKS ON THE PRESENT STATE OF THE QUARANTINE  
LAWS.

BY FREDERICK FORBES, A. M., M. D.,  
OF THE BOMBAY ARMY.

“Novi semper scriptores, aut in rebus certius aliquid allaturos se, aut scribendi arte rudem  
vetustatem superaturos credunt.”—T. LIVIUS.



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TO  
ALEXANDER FORBES, ESQUIRE

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THIS TREATISE IS INSCRIBED

AS A  
MARK OF RESPECT AND GRATITUDE.





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The following Treatise, on the Nature and History of Plague, as observed in India, is presented in the same state in which it was delivered to the Faculty of Medicine of the University of Edinburgh; a few explanatory notes alone having since been added. The Remarks on Plague and Quarantine Laws, though very imperfect, are offered in the hope that they may assist in shewing the necessity and expediency of adopting an improved system of sanitary regulations, by drawing attention to the defects and abuses of those now in force.

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ON THE

NATURE AND HISTORY

OF

INDIAN PLAGUE.

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THIS disease, which has prevailed, at different periods, in the north-west of the continent of India, was first described by Mr. M'Adam, of the Bombay Medical Service, as reported to have appeared in the provinces of Kach'h and Kattiwár, in 1815 and 1816, and subsequently, from personal observation, by Messrs. Whyte and Gilder, of the same service, in 1820. It continued to ravage these districts, and the western part of the Zillah of Ahmedábád in Gújrát, up to the year 1821, when it appears gradually to have become extinct. At the time of its first appearance in Kattiwár, it is said also to have prevailed at Haïdarábád, the capital of Sind'h. In the end of June 1836, it again shewed itself in the large trading town of Páli, situated in the centre of the province of Márwár, from whence it spread over a great part of the surrounding country, desolating the city of Jôdhpur, and approaching within a short distance of Ajmír, and the British cantonment at Nasirábád. Before detailing its rise and progress, it will be proper to give a short sketch of the geographical position, and natural features of that part of India where it has hitherto prevailed.

Excluding Sind'h, of the circumstances of the disease, in which territory we have no proper account; the tract of country more immediately to be considered extends from S. S. W. to N. N. E., between the parallels of  $22^{\circ}$  and  $27^{\circ}$  north lat. and  $70^{\circ}$  and  $75^{\circ}$  east long.; comprising portions of the provinces of Kach'h, Kattíwár, and Gújrát, the whole of Márwár Proper, and part of Meywár. The whole presents the general characters of a flat country, but shews considerable variety as to soil and climate. Márwár, the most northerly portion, is level, sandy, and comparatively barren; naturally producing scanty coarse grass and stunted jungle, consisting chiefly of the *Acacia Arabica*, *A. catechu* and allied species, *Zizyphus vulgaris*, and *Jujuba*, *Melia azedirach*, *Tamarix Orientalis* in the dry beds of torrents, and great quantities of the Mudár or fire plant, the *Asclepias* or *Calotropis gigantea*; while the detached rocky hills are covered with the *Euphorbia antiquorum*.

The soil is, for the most part, little else than pure sand or gravel, which, in many places, passes into coarse sandstone. Detached conical hills of porphyritic rock are scattered at wide intervals over the south-eastern part of the province. It is intersected by the Lúní, or Salt river, which passes near Pálí, and several smaller streams, which are dry for the greater part of the year, or only shew scattered pools of stagnant water, strongly impregnated with salt; a thick efflorescence of which generally covers the adjacent soil. In the lower part of the Lúní the pools of water are often of considerable size, and contain large alligators, the banks being lined to some distance, on either side, with thick tamarisk jungle, in which lions abound; the tiger, however, is rarely seen. In and near the beds of the streams abundance of water is always procurable, by digging to the depth of a few feet. In consequence of this, their banks are thickly planted with villages; every village being surrounded by a portion of cultivated ground, richly manured, and constantly irrigated from the wells, yielding at least two crops of wheat annually. The extent of ground thus cultivated, however,



is necessarily small, from the labour and expense which must be bestowed on it; but, after the scanty annual rains, even the most sandy, and apparently barren soils, produce considerable crops of juára, (a large variety of *Holcus sorghum*, the dúrra of the Arabs,) and of bájra, or *Holcus spicatus*. Except in the vicinity of the hills, the water is, throughout, more or less brackish;<sup>a</sup> and in many parts, but more especially towards the western boundary, and in the neighbourhood of the Lúní, are extensive tracts of Runn or salt marsh, the manufacture of that article being carried on to some extent. The tanks, or reservoirs of water, whether natural or artificial, are few in number and of small size, rarely containing a supply throughout the year.<sup>b</sup> The annual fall of rain is very trifling, and probably does not exceed that at Bálmir, a short distance to the west of the Lúní, which did not amount to nine inches for the whole year 1837, as may be seen by the accompanying meteorological register, kept by me at that station.<sup>c</sup> The climate of Márwár generally resembles that of Bálmir, and the prevailing winds are the same in both.<sup>d</sup> In the parts remote from the Lúní the scar-

<sup>a</sup> At Kúrlo and Sívkur, in the open desert between Bálmir and the Lúní river, and where there are gypsum beds of some extent, six pints of clear water from the wells afforded, on evaporation, a solid residuum weighing one hundred and two grains, and consisting entirely of sulphate of lime.

<sup>b</sup> In the height of the dry season, when the contents of many of the tanks are exhausted, a certain quantity of water can generally be procured by digging pits in their beds, and this is sometimes all that the inhabitants of a village have to depend upon.

<sup>c</sup> Appendix, No I.

<sup>d</sup> It must be noticed, however, that, at a distance from the hills, the extremes of heat and cold are considerably greater than those experienced in camp at Bálmir. Between that place and the Lúní, in the middle of January, I found the thermometer, during the night, generally so low as 26° and 28°, and the pools, near the wells, incrustated with ice. What appeared to me very singular was, that in the hollows, between the low sand hills, the temperature, during the night, was from eight to ten degrees less than on their summits, even although the difference of elevation did not

city of water is often very great ; and, in seasons where the rains have been scanty, vast numbers of the cattle are carried off from this cause. As no cattle are ever killed, this may be considered rather a desirable occurrence, as the villages are thereby partially freed from the multitudes of lame and diseased animals which would otherwise encumber them. Upon the whole, this province may be said to be dry to a great degree, free from jungle and rank vegetation, except in the immediate vicinity of some of the towns and villages, poor, and rather thinly inhabited, but by no means unhealthy.

Meywár, or Udépur, is separated from Márwár by the Arvállu range of hills, which is of considerable elevation, and which contains the district of Mhairwára. Meywár, in its general features, resembles the S. E. portion of Márwár ; being for the most part sandy, with scattered ranges of rocky hills of moderate height ; the climate is however more moist, and the annual fall of rain greater. Water is everywhere found pretty near the surface.

The Lúní river, after leaving Márwár, passes through a level and fertile plain, and discharges itself by several channels into the extensive salt marsh, known by the name of the Runn of Kach'h. From this point, to the northern extremity of the Gulf of Kach'h in one direction, and from the southern border of the Thurr or Indian Desert, to the boundary of Gújrát in the other, are included the districts of Pákur, Jutwár, and Wágur, the first of which may be called a peninsula, being bordered by the Runn on every side but the north. According to Sir A. Burnes, Pákur is under the 24th deg. of north lat. and the 71st east long. and extends only twenty miles from north to south, and thirty-five from east to west, interspersed with rocky hills, of a light soil, well supplied with wells ; the water being about ten feet from the surface, and of good quality, though so near the Runn.

exceed from thirty to fifty feet. This was uniformly the case, and led us always to choose our halting places for the night on the most elevated spots, instead of the cold, though apparently sheltered hollows.

Wágur is, in like manner, nearly surrounded by the Runn, its southern boundary being the Gulf of Kach'h, while Jutwár is situated between a branch of the Runn and the western Bunáss river, which contains but little water during a great part of the year. Both Wágur and Jutwár present the general features already described, and are usually considered healthy.

Kattiwár is the peninsula formed by the Gulf of Kach'h and Kámbay; it is hilly and fertile, and well watered by small streams; the northern part of it, however, or district of Jaláwár, with which we are more immediately concerned, together with the adjacent portion of Gújrát, is flat, intersected with salt marsh, and possessed only of scanty vegetation, except towards its eastern limit. It has the Runn for its northern boundary, while a belt of low land, more or less marshy and impregnated with saline matter, extends, in an oblique direction, to the head of the Gulf of Kámbay, and along the coast forming its eastern limit. The soil of the western portion is light and gravelly, but more to the eastward there is a good deal of rich black loam, and, in proportion as the soil becomes richer, and vegetation more luxuriant, the climate becomes more moist and unhealthy, like that of Gújrát in general.

The following sketch of the disease embodies the substance of a report, which was drawn up and sent to the Bombay Medical Board, in the end of February 1838, after a visit to Páli, and other towns and villages in Márwár, exhibiting its features as they then appeared, without reference to the reports of other medical officers, none of whom I had at that time seen, with the exception of the short ones of Messrs. Cramond and White of the Bombay Establishment, and that of Dr. Russell, on its appearance in the village of Rínchôr in Meywár. As differences, more or less important, will generally be found, in the descriptions of the same disease by various individuals, whether arising from their not having seen it at the same season of the year, or period of its existence; or from its features being more or less changed or modified;



or, perhaps, from greater or less facilities of obtaining accurate information, I have thought it best to give my account of it as it stood, and by afterwards considering the phenomena under distinct heads, to compare it with the accounts of others; by this method I trust some apparent discrepancies in its history may be explained. The excellent and impartial summary given by Dr. Ranken, Secretary to the Bengal Medical Board, in the volume containing the Reports of the Bengal Medical Officers, published at Calcutta in 1838 by order of government, may seem to render this attempt of mine superfluous; but, as my observations refer to a much later period than that embraced by these reports, I conceive they may not be devoid of interest, as supplying a continuation of the history of the disease, while, at the same time, it will be of some importance, on various accounts, to notice the reports of Messrs. White and Cramond, which are not included in Dr. Ranken's summary.

This disease is known in India by many names, some of which are sufficiently characteristic, while others might be applied to any very common or fatal sickness. The most common are Gánt'h ká rôg, or gánt'h kí Mándagí, *i. e.* the knotty or bubonic disease; Wábá, an Arabic word, signifying the plague, and synonymous with Tá'aún, by which term the true plague of Syria and Egypt is always designated; Udbháo, meaning birth or production; and Marrí or death.<sup>a</sup>

In the most common variety the invasion is sudden, not being preceded by any feeling of disorder or uneasiness sufficient to engage the notice of the patient; it generally takes place in the evening, and is rarely attended by rigors. The occurrence of the febrile symptoms, and the pain and swelling of the glands, appear, in most cases, to be coetaneous; in

<sup>a</sup> The name Marrí is applied to any wide spreading and destructive disease, as the *Cholera Spasmodica* and the like; the more correct and characteristic name, however, given to the cholera by the Hindús, is Marhí, which signifies gripe, twist, or contortion; and, *par excellence*, Mahá Marhí, *i. e.* the Great Cramp.

many the glandular swellings shewed themselves before the full developement of the fever, while in none did they occur at a later period than the second day. The symptoms most generally present were—great prostration of strength, giddiness, frontal headache, excessive thirst, dry burning hot skin, moist and white tongue, pulse from 110 to 130, small and weak, some vomiting and tenderness of *epigastrium* on pressure, bowels confined, urine scanty and high-coloured, great indifference as to recovery, and disinclination to speak or answer questions. One of the most constant and troublesome symptoms was a violent burning pain, sometimes referred to the *scrobiculus cordis*, but generally designated by the patient as a “burning at the heart.” The fever was of the remittent type, with marked tertian exacerbations and low delirium. If uncomplicated with thoracic or abdominal affection, and if the patient survived the fifth day, it commonly abated in violence after the seventh or eighth; so that, in the third week, little else remained than extreme debility and sympathetic evening flushes from the buboes, which, by this time, had advanced to suppuration. In most of these cases, however, during the cold season, more or less cough was present, generally dry, but sometimes accompanied by white frothy expectoration.

In the more violent and malignant form, the attack sets in suddenly with severe headache, staggering and giddiness, quickly followed by delirium. The morning remission is scarcely perceptible, except by the abatement of the delirium, no glandular swellings appear, or they remain small, hard, and exquisitely painful, vomiting of bilious matter, and latterly of dark coffee-coloured fluid comes on, the bowels are either constipated or the stools frequent, black, and fetid; the eyes are muddy or turbid, and the *adnata* highly vascular, the teeth covered with *sordes*, and the patient tosses and moans in bed. A dry cough now frequently supervenes, attended with severe pain in the region of the heart, and laboured respiration, partial insensibility passes into profound *coma*, often accompanied with *trismus*, and death takes place early in the morning of

the fourth day, or, where the symptoms are less violent, on the morning of the sixth, although many are said to have died on the second or third.

The most fatal, though comparatively rare variety, in which it is said no recovery has been known, sets in with scarcely any febrile excitement, if we except a very slight acceleration of the pulse. The most prominent symptoms from the commencement are, slight cough and bloody expectoration, attended, in a very few cases, with a great degree of oppression, or even of burning pain about the *præcordia*. The cough appears, to an observer, more like a voluntary effort to relieve oppression or constriction about the chest, than to be caused by pain or irritation. The body is covered with frequent clammy sweats, the countenance exceedingly anxious and wild, thirst urgent, tongue clean or only slightly furred, bowels slow, the urine increased in quantity and loaded with blood, which also oozes from the gums, and is said to appear in the stools. The expectoration of blood becomes more copious; to the anxiety and oppression of the chest is added acute pain in the region of the heart; the pulse becomes quick and thready, the action of the heart tumultuous; faintness and complete exhaustion come on, and a fatal syncope terminates the sufferings of the patient, generally within forty hours from the attack, the intellectual faculties remaining perfect nearly to the last.

In the mildest form, the glandular swellings make their appearance with little constitutional disturbance, attended only by languor, debility, and a general feeling of indisposition. They go on slowly to suppuration, and health is very gradually restored.

It is, however, by no means rare, as in all similar diseases, to see the different forms mixed, or merging in each other. The attack may be at first mild and apparently without danger, the buboes well developed, and the fever slight, when, from the third to the fifth day, and sometimes so late as the seventh; the occurrence, either of delirium, *coma*, bloody expectoration, *diarrhœa*, retention, or suppression of urine,



or recession of the buboes, point out an unfavourable change, and the fatal termination soon follows as in the more aggravated forms.

It is necessary to consider in what particulars this report agrees with, or differs from, the other accounts given of the disease, as it is of importance to have as clear a view of its symptoms as possible, and which can only be obtained by comparing them as they occurred to various observers, in separate localities, and in different years and seasons. It must be remembered, however, with regard to the sickness which prevailed in Gújrá́t, Kattíwár, &c., from 1815 till 1821, that both Mr. M'Adam and Mr. Glen describe it from report, not from personal observation, which is much to be regretted, as none would have been more able to do justice to the subject had the opportunity offered. From the difficulty of collecting accurate information on such a subject, even in Great Britain, with the aid of skilful and intelligent witnesses, and correct records, some idea may be formed of the almost impossible nature of such an attempt in India, by means of the oral testimony of ignorant and superstitious people, having little intercourse with Europeans, who keep no written records, and who never know exactly their own age; especially when we consider their constant propensity to falsification in the most trifling matters, to suit their own interests or prejudices.<sup>a</sup> As it would be almost impossible to institute a just comparison of the reports, by detailing the symptoms in the mixed and general manner in which they are given, it will be necessary

<sup>a</sup> Nine out of ten of all classes of Hindús lose all recollection of the particulars of any remarkable occurrence in a very few years. A striking instance of the apathy of the natives regarding extraordinary events is found in Captain, now Sir A. Burnes' account of the changes produced in Kach'h by the earthquake of 1819; which passed unheeded by the inhabitants; although the whole surface of an extensive tract of country was completely changed by the elevation of the Ullah-bund, upwards of fifty miles in length and sixteen broad, and the submersion of the fort of Sindhri, and sinking of the plain as far as Lakhpat so as to admit the waters of the ocean.

to consider the disease under separate heads, referring to the four well-marked varieties which, at one period or another, have been sufficiently distinct, and which may be thus classed: 1st. The malignant and fatal form, where the glandular swellings are not developed. 2d. The more common, though still very fatal form, where the febrile symptoms are severe, and the glandular swellings more or less distinctly developed. 3d. The milder and less dangerous variety, where the febrile disturbance is comparatively trifling, and the glandular affection the most prominent symptom; and, 4. The most rare variety, characterized by passive hæmorrhage from the mucous surfaces.

Considerable difference exists in the various reports, as to the type of the fever observed in all the varieties, and it must be obvious to every one conversant with fever in any shape, that unless the patients are frequently seen, no satisfactory information can be obtained on this point; and it must be equally evident, that the reports of the people themselves regarding it are little to be trusted. We know that in fevers even of the most purely continued type, there are periodical exacerbations more or less distinct; and, consequently, it must always be a matter of difficulty to say what degree of alleviation of the symptoms constitutes remittent fever, as what may seem so to one observer may not be seen in the same light by another, more especially if the patient has not come under his notice during or immediately after the invasion, so that the original violence of the febrile excitement might be known.

The nature of the fever, when noticed in the reports, is variously characterized as low typhous fever, (White); high fever, (Keir); malignant, putrid, affecting the glandular and nervous systems, (Dr. Irvine). It is clear that, from these statements, little can be learned, and that the only correct opinion is to be found from a comparative view of all the symptoms. The type is as variously stated; as remittent, in the worst cases continued, (M'Lean); intermittent, remittent, anomalous, (Irvine); shewing morning remissions, (Russell); but it will be seen that both it and the character of the fever

varied in the different forms, and at different periods of its prevalence. Upon the whole, it would appear, that in the first form the fever was continued, and of that peculiarly intense character commonly seen on the first breaking out of pestilential diseases, where the vital powers appear, as it were, so completely overwhelmed, that no healthy reaction can be established, on account of the failure of their regulating influence, and where even the usual febrile symptoms are not distinctly evolved. In the second form, it appears generally allowed that remissions were observable, and often well marked; at the same time that the prostration of nervous and muscular energy was disproportionately great, when compared with the other symptoms. Although in the mildest variety perfect intermissions are said to have been common, there is reason for believing that this was only in the decline of the disease, and when convalescence was approaching; in none, at least of this description of cases which I saw, were the patients free from a certain degree of fever before the end of the second week. The hæmorrhagic form appears to have been attended with a very slight degree of fever, so slight, indeed, as, in some instances, to be scarcely perceptible.

The state of the pulse is variously given; but it was commonly found frequent, soft, and compressible; varying from 110 at the commencement, to 140 or 150, in fatal cases; it very rarely appears to have been strong, full, or hard, except in a few cases of the second variety; and, in the third and fourth forms, it was very little altered from the natural state.

The two first varieties were attended, from the outset, with great affection of the head, and oppression of the brain, as shewn by the excruciating headache, stupor, and muttering delirium, mentioned in most of the reports, and the *typhomania* or *coma* that invariably preceded death. Giddiness or staggering, however, do not appear to have been noticed by them; but, in the few cases of recent seizure, which I had an opportunity of seeing, they were very prominent symptoms; the appearance of the patient resembling that of an intoxicated person. In the milder forms, the headache was generally



slight, and referred chiefly to the *sinciput* or eyebrows, while in the hæmorrhagic variety it was often altogether absent till a short time before the fatal termination, and, in some, did not occur at all. In Mr. Glen's report, it is stated, on native authority, that the patient, when going about his usual business, or sitting at his meals, fell down as if shot through the head, and sometimes continued insensible through the course of the disease. Such cases appear very doubtful, and contrary to analogy, and we do not find them noticed by any of the reporters. It is certain, however, that in many instances, *stupor* and insensibility very rapidly supervened. Tremors and *subsultus tendinum* were rarely observed.

The remarkable appearance of the eyes is often alluded to. They were glassy, or like that of a drunken man, the *conjunctiva* bloodshot, or lake-coloured, (Irvine); turbid, (Keir); dull and watery, (Cramond); dull, muddy, like drunkards', (Mr. Russell). Many of the terms used, however, must be understood to apply rather to the general expression of the countenance, such as, that it was wild, unnatural, or vacant. Dilatation of the pupil is mentioned in one case by Mr. Russell, but this I never met with; a degree of contraction of it, on the contrary, appeared to me sometimes to accompany the delirium or *stupor*, and was, I am inclined to think, pretty common in such cases.

The state of the tongue is described as very variable, being sometimes white, foul, furred; white in the centre with fiery red papillæ, (White); but it appears generally to have been white or yellowish, and seldom brown or dry but in the last stage and severest forms of the disease.

The skin seems to have been very uniformly hot and dry in the two first varieties, and this agrees perfectly with my own observations; it is stated, however, in Mr. Glen's Report, that "general as well as partial perspiration, often took place without at all producing a remission of the pyrexia; another curious circumstance," as Mr. Glen might well remark: "For I know not of any other fever in which general perspiration appears without alleviating the symptoms." This,

however, is contrary to the experience of all who saw the disease, and no less so to the phenomena of febrile affections in general, and one must hesitate in allowing any great degree of credit to such native reports.<sup>a</sup> In the milder forms the exacerbations and paroxysms generally terminated by perspiration, and clammy and irregular sweats accompanied the hæmorrhagic variety.

Gastric affection was very often present in the first and second forms, but not, as would seem from the various reports, to such a degree as to affect materially the character of the disease. It certainly appeared to me to be common in bad cases of the two first forms, and in one or two instances I observed vomiting of dark, tenacious, and pitchy-looking fluid, on the approach of the fatal termination, and others were reported to me. By some, vomiting of bilious fluid is noted, generally in the stage of invasion, but Mr. M'Lean says this was not common at any period of the disease.

The information regarding the state of the bowels is very unsatisfactory, as might be anticipated, from the defective means of observation, arising from the circumstances in which both patients and medical officers were placed, but more so from the constant habitual use of opium by many of the people when in a state of health, and from its frequent administration to the sick in order to quiet them or check *diarrhœa*. From this cause also, which was generally concealed by the patient's friends, there is little doubt that all the most important features of the disorder were often masked, and that the delirium and *stupor* were not unfrequently produced or aggra-

<sup>a</sup> Although it is no doubt true as a general assertion, that alleviation of the symptoms accompanies or follows the appearance or increase of sensible perspiration in fevers, yet there are occasional exceptions to this rule, more especially in typhoid fevers; and Professor Graham drew attention to a very striking example, which occurred in his clinical wards last winter, where the body of the patient emitted, as was remarked, "a cloud of steam" on removing the bed clothes, without any mitigation of the disease. In case 5th, here reported, in which the termination was rapidly fatal, the perspiration was profuse. This, however, was of the purely hæmorrhagic variety, and of rare occurrence.

vated by opium. Constipation and *diarrhœa*, or even dysentery, were of common occurrence; but the first certainly appeared to me to be most often met with. Tumidity and hardness of the *abdomen* were remarked by Mr. M'Lean, but not adverted to by others; pain on pressure was seldom felt, or at least complained of. In the fourth variety, the alvine discharges contained blood.

During the whole course of the sickness, but especially in the cold season, pulmonary affection was often met with, though rarely in a severe form; the respiration indeed being seldom materially affected, and the only thing complained of being slight cough with mucous expectoration. In the first form, if death did not take place before the third day, there generally appeared to be more or less *pneumonia*, masked by the oppressed condition of the brain, and indicated by dry cough and laboured respiration; occasionally a very small quantity of blood is said to have been discharged in clots, but this was probably from the nose or *fauces*, and not from the lungs. Although at first sight the lungs would seem to have been very violently affected in the fourth or hæmorrhagic variety, yet they were often in reality less so than in the first and second forms; for, although blood appeared in the sputa, it was equally present in the alvine and urinary discharges, while there was generally little difficulty of breathing, even at an advanced stage, and only a slight cough excited by the presence of an increased quantity of fluid in the air passages.

A symptom very often present, and certainly one of the most remarkable and characteristic, was the sensation referred to the region of the heart, and which varied in degree in different cases from a mere feeling of oppression or constriction of the chest, to pain of the most acute and agonizing kind. It was almost invariably present to a greater or less degree in the more acute forms, and in the fourth it was the only very prominent affection. In the worst cases of the second form, where the degree of oppression of the brain obscured or suppressed the other symptoms, this feeling was indicated by the incessant tossing and moaning of the patient,



while the countenance was expressive of the most intense agony.

Suppression and retention of urine are not alluded to in any of the reports, but in several of the cases I saw, either one or the other was remarked. The latter was most commonly met with in the advanced stage of the second form, while in two instances of the first and malignant variety, the urinary secretion appeared to be entirely suspended; this was always looked on as a fatal sign.

The last class of symptoms to be considered, comprises the glandular swellings, carbuncles, and malignant pustule. Carbuncles do not appear to have been seen by any of the reporters but Mr. Cramond, and it is somewhat doubtful whether he speaks from personal observation or not. He says, "sometimes carbuncles make their appearance on various parts of the body, but they are by no means common." Dr. Keir saw only one case of malignant pustule in a child. *Petechiæ* were not observed, though, even had they been present, there would have been no little difficulty in recognizing them, in skins none of the fairest, and often overrun with vermin.

In all cases of the second and third varieties, buboes or other glandular swellings were present; and as the first and fourth forms of the disease were comparatively small in number, I feel no hesitation in asserting that they occurred in five-sixths of the whole. Of forty-eight cases, of all degrees of mildness and severity seen at Pálí, in five only were no glandular swellings observed. At Brahman Píplí and Náthdwará all had buboes (Mr. Russel); at Samári there were only two without them. At Dhollera in 1821, Mr. Glen's informants reported buboes, (that is, swellings of one or other of the axillary, parotid, or submaxillary glands, as well as of the inguinal) in every case, but Mr. Glen justly remarks, that the instances in which they did not appear, were probably referred to another disease. Considerable difference exists as to the time at which they made their appearance, and this no doubt varied in the different forms. Thus Mr. White says they ap-

peared on the second day, as does also Mr. Cramond; buboes in the groin appeared on the first or second day, the parotids some days after, (Dr. Russell) : at Náthdwára soon after, or during the febrile attack (Mr. Russell) : sometimes almost simultaneously with the fever, more commonly in the course of the first or second day, rarely so late as the third or fourth, (M'Lean); consentaneously with the disease in the worst cases (Dr. Irvine.) From what I could learn, I would be inclined to state their appearance as often coetaneous with the febrile symptoms, and never later than the second day in the severe cases; while in the third variety, they were the first or only remarkable signs of the disease. Their sudden resolution or recession was accounted a fatal symptom, and if not present from the first, their appearance in the course of the disease, indicated great danger.

The glands chiefly affected were the inguinal, axillary, cervical, parotid, and submaxillary; sometimes several of them together. Tumours were also observed on other parts of the body, as the back, *occiput*, and scapular region. At Pálí I observed only three parotid or submaxillary swellings, all the others being either axillary or inguinal. The glands of the right side were most commonly affected, although Mr. M'Lean seems to have found them chiefly on the left. In eight cases at Náthdwára, Mr. Russell found six buboes on the right side, and two on the left. Of twenty-six bubonic and axillary swellings at Pálí, I found only eight on the left side. It has been observed that the parotid glands do not swell until the disease is somewhat advanced, and that they are most frequently affected in women and children.

During the height of the febrile action, the glandular swellings remained small, hard, somewhat moveable, and very painful; as the disease declined they were sometimes discussed, but generally became large, soft, diffuse, and less painful, gradually advancing to suppuration. In the milder cases, and in the third variety, the advance to suppuration was often rapid. I never observed them red or discoloured before the mitigation or decline of the disease, unless irritating or escha-

rotic applications had been used; and the expressions, "red, and fiery red," in Mr. Glen's report, must, no doubt, refer to such cases. It is stated also, in Mr. Gilder's paper, apparently from native information, that suppuration of the glandular swellings occurred on the fourth or fifth day; but this must certainly be incorrect.

In a great majority of cases, the fatal issue takes place in the latter part of the third, or beginning of the fourth day, often on the second; sometimes, though rarely, within the first. To those who survived the third day the fifth was observed to be most fatal; but, in the less severe cases, deaths occurred at all periods, from the fifth to the tenth. Differences were observed in this respect, according to the season and period of prevalence of the fever. Generally speaking, on its first breaking out or re-appearing, death took place on or before the end of the third day; and those who lived till the fifth for the most part recovered, while, towards the decline of the malady, this rule obtained in a few instances only, as all the phenomena then became more indistinct and irregular.

Having now considered, in detail, the chief features of the disease, and compared the statements of various observers, I may give, in a few words, the results of my visit to Páli, in the spring of 1838. From the 29th January to the 3d February inclusive, being six days, I saw forty-eight cases, of which thirty-four were mostly of one description, closely resembling Case thirteen, as detailed below; many having reached from the tenth to the twentieth day of the disease, with large buboes, no great degree of fever, parched skin, tenderness of *epigastrium*, tongue white and moist, eyes dull, heavy, or suffused, bowels generally very slow, but sometimes loose; and the greater part with more or less cough. Some few complained of little else than the pain of the buboes, and great weakness and loss of appetite. All the thirty-four had glandular swellings. The remaining fourteen cases, frequently seen during their progress, and the symptoms carefully noted on the spot, are given in detail; not only as affording examples



of the different degrees of severity, but also of the distinct varieties and irregular modifications of the disease.

### CASE I.

*January 29th, noon.*—A young Hindú girl, daughter of the Faujdar or police magistrate of Páli, about seven years of age, and already a widow, was seized, on the 25th, with fever, a small painful swelling appearing, at the same time, in the right *axilla*. For the first three days the symptoms were, severe headache referred to the *sinciput* and eye-brows, constant fever, and urgent thirst. On the evening of the third day she became dull and semicomatose, after a violent exacerbation of the fever with delirium. Is at present partially sensible when roused, complains of headache when questioned, and shrinks from slight pressure on the *abdomen*; pulse frequent, small, and weak, skin dry and burning, feet rather below the natural temperature, tongue moist and clean. Had some vomiting, and one evacuation from the bowels on the second day, after taking a mixture of ginger and dall, (a kind of pulse). The tumour in the *axilla* can scarcely be felt, and does not appear to cause pain. Some draughts of lime juice and carbonate of soda, with tincture of bark and opium, were prepared for her, and hot fomentations applied to the *abdomen*. *5 p. m.*—All the bad symptoms are aggravated, pulse very frequent and thready, action of the heart tumultuous, strong bronchial *rhonchus* over the chest. Is nearly insensible, but constantly tossing and moaning, and appears to suffer much pain. Bowels said to have been twice opened since noon. None of the medicine has been given, the reason assigned is, that the night of the fifth day usually proves critical, and that they would rather put it off till morning. She died about midnight.

## CASE II.

*January 29th.*—Jiwání, a musalman girl, nine years old, daughter of a chípa or calico printer, was seized ten days ago with fever without any previous cold stage. On the fourth day *diarrhœa* supervened, the stools amounting to three or four daily. On the sixth day a dry cough also came on, without any diminution of the *diarrhœa*. On the seventh day of the disease, or two days ago, her father gave her a quantity of opium to check the *diarrhœa*, which it did for a time, but it recurred again this morning. The stools are described as yellow and pasty. At present there is much cough, no expectoration, skin dry and hot, pulse quick and sharp, tongue red and dry; has much thirst; is very restless, and moans incessantly. 30th, died this morning.

## CASE III.

*January 29th.*—Lachmí, aged fifteen, the daughter of a man who roasts grain for sale, was seized, on the afternoon of the 27th, with fever and bubo in the right groin, the pain of the latter occurring simultaneously with the access of the fever. Vomiting came on on the second day (yesterday), and much bile was discharged. The bowels are said to have been daily opened, the stools being extremely foetid and dark-coloured. The present symptoms are, a burning hot skin, sharp and frequent pulse, gums of a deep purple tinge, jaws firmly locked, countenance livid, is nearly insensible and continually moaning. Since yesterday evening has had much cough, with white frothy expectoration. The bubo in the groin is very small and hard, a mixture of the juice of the mudár plant, (*Calotropis gigantea*), opium and arsenic, has been applied to it. While I was in the house she vomited a quantity of dark-coloured tenacious fluid like diluted treacle. Administered with much difficulty a dose of camphor, opium, and

calomel, in a little honey, but with little or no hope of benefit, as she was almost moribund. She died during the night. This patient was actually lying on a heap of the roasted jowár, which her father prepares for sale, which was no doubt disposed of and eaten as usual.

#### CASE IV.

29th *January*.—Seo L'all, aged seven, son of a brazier, was seized on the 23d with pain in the situation of the right parotid, or rather a little below and behind it, and on the evening of the same day with fever, without rigors or cold stage. The fever has continued since with daily evening exacerbations, and accompanied with slight cough, until yesterday, when it became more severe; and to-day he is said to have expectorated a small quantity of fluid blood. Complains of great pain of chest, skin very hot and dry, pulse small and frequent, bowels not opened for the last four days, and only once since the access of the disease; tongue brown and dry, thirst urgent, urine scanty and red, respiration natural. Had a poultice applied to the tumour, and gave him a mixture of a few grains of jalap and Dover's powder. 30th. Is much worse to day, pulse 150, small and weak, respiration hurried and labouring, tongue brown and dry, teeth encrusted with dark *sordes*, bowels still confined, moans much, but is sensible when roused. As his friends refused to give him any medicine, the poultice was merely continued to the tumour, which was much the same as before, soft, and about the size of a walnut. He died in the evening.

#### CASE V.

29th *January*, 3 *p. m.*—Salúk, a respectable sáhukár or merchant, thirty-seven years of age, of a strong, full habit of body, states that yesterday he felt quite well, but that, during the night, he became restless and uneasy, and was seized in the morning with cough and expectoration of blood. He has



no other complaint whatever, but is excessively alarmed, as in similar cases no recovery has been known to take place. There is neither headache, heat of skin, nor pain of chest; the pulse is small, weak, and slightly accelerated, but without any sharpness; bowels opened once this morning. He has had several slight partial perspirations over the head and upper half of the body. The expectoration is copious and of a bright rusty tinge, but he says that he spat up some quantity of fluid blood about two hours before I saw him; the cough is not accompanied by pain. The urine is plentiful, and of a deep cherry-red colour, evidently containing blood. Some powders of bark, ginger, and cinnamon were given him, to be taken every two or three hours, in a mixture made by rubbing down a few grains of camphor with brandy and adding milk. *Seven p.m.*—His attendant came to say that he had vomited the powder, that the expectoration of blood had increased, and that a profuse perspiration had broken out. A dose of six grains of sulphate of quinine, combined with calomel and opium, was then given, and the powders ordered to be continued. *30th Jan. Mane.*—Vomited the pills about an hour and a half after taking them, when a profuse perspiration broke out, and the bloody expectoration increased. He now complains of some pain in the region of the heart, and in the loins; cough very trifling, expectoration frothy and of a bright red, skin slightly hot and moist, tongue red and clean, thirst great, bowels not opened since yesterday morning, pulse frequent, small, and very compressible, urine copious and bloody. There is evidently an oozing of blood from the gums, which are swelled and spongy; the quantity of blood lost since the attack must be altogether very great. None of the powders have been given. A large mustard cataplasm applied to the cardiac region, and the quinine and opium pills to be repeated. *Vespere.*—Is now much worse, complains of great and increasing debility, and occasional faintness with much thirst; cough and expectoration of blood continue as before. Skin moist and of natural temperature, bowels not opened, action of the heart tumultuous and strong, pulse at

the wrist quick, thready, and indistinct. The functions of the brain remain undisturbed, and the pain and anxiety in the cardiac region are less than before. A mixture of quinine, with camphor and opium in brandy, was prepared and ordered to be given in small quantities repeatedly. 31st. Died during the night. This patient had been living for some time in a caravanseraï or lodging house, frequented by merchants and traders, and had been much in company with a man who had died in the adjoining apartment four days before, of precisely the same disease, after a two days' illness.

#### CASE VI.

*29th January.*—A musalman; about twenty-five years of age; was attacked fifteen days since with violent fever and delirium. On the second day, his speech became confused and stuttering, and towards evening he appeared to have complete paralysis of the tongue. In a violent fit of delirium he got out of bed, and fell with great force on his head against the sharp corner of a stone pillar, causing two wounds, one above the left eye-brow, and the other over the middle of the left parietal bone, from which he is said to have lost upwards of a “ser” and a half, or more than three pounds of blood. Next day the febrile symptoms were much diminished, and in a day or two had quite subsided, but the partial loss of speech continued, and he remained in a semicomatose state. He now lies on his back, muttering occasionally, and at times making violent outcries; the pulse is nearly natural, the skin cool, but dry; the bowels are said to be regular. A paste of pounded onions, flour, and butter, has been applied to the wounds on the scalp, which appear irritable, with everted edges, and are discharging a thin pus; no fracture however can be detected. Some pills of calomel and opium were ordered, and a common poultice directed to be applied to the wounds. 30th. No change in the symptoms; the people about him have re-applied the old paste of onions, instead of the poultice; and persist most carefully in excluding cool and fresh air, and in sup-

plying him with food and hot drinks. I did not see him again.

### CASE VII.

30th *January*.—Dillú, a Hindú widow, about forty years of age, and of rather spare habit of body; was seized on the 28th with pain and swelling in the right *axilla*, followed by fever in the course of the night. The fever was ushered in by a slight cold stage. A remission, with slight perspiration, took place at noon, on the second day (yesterday), but the evening exacerbation was very severe. At present the skin is cool and dry, the pulse small, weak, and frequent; thirst urgent; tongue red at the edges, with brown furred centre; bowels said to be regular; urine scanty. Complains of slight headache, and has pain on pressure at the pit of the stomach. A pill was given, containing a few grains of calomel, two of camphor, and one of opium, and a scruple of cinchona bark directed to be taken every three hours; a mustard cataplasm, applied to the cardiac region, and a common poultice to the tumour in the *axilla*. 31st. Had considerably less fever last night than on the night preceding, but it is probable that there is a tendency to tertian exacerbations, which would account for this; bowels once opened after I saw her, evacuation yellow and liquid; pulse very little quicker than natural; headache trifling; has no thirst; tongue slightly furred; appears in some respects much better, but there is retention of urine, none having been passed since last night. The swelling in the *axilla* is larger and softer. Hot fomentations were applied to the *hypogastrium*, the pill was repeated, and another ordered to be given at night; the powders to be continued. *Vesperi*.—Her brother came to say that she had as yet passed no urine, nor had her bowels been opened. The fever was said to be less, but the axillary tumour had receded, and could not now be felt. Sent a draught containing a little jalap and nitrous ether, and directed the repetition of hot fomentations, followed by a cataplasm of pounded garlic to the *hypogastrium*.



*February 1st.*—Her brother did not come to me again, probably on account of my having hinted at relieving the bladder by the introduction of an instrument, and I could not learn the issue of the case, but it was in all likelihood fatal.

### CASE VIII.

*30th January.*—Yemeni, aged about eight; daughter of a musalman chípá or calico printer, was attacked with fever on the night of the 28th, without the appearance of any glandular swelling. At present her skin is very hot and dry; pulse 135, small, and weak; vomiting of fluid like coffee-grounds, gums and teeth covered with a black crust, eyes dull and watery, is with difficulty roused, and lies tossing and moaning in bed. For the first two days she complained of headache. The bowels have not been opened since the attack. *31st.*—She died this morning; her friends did not send for medicine, nor appear to wish any to be given.

### CASE IX.

*31st January.*—Gúmní, a Hindú woman, wife of a baniyá, or shopkeeper, aged about thirty-six; of spare habit of body; was attacked on the morning of the 24th with fever, accompanied by pain and slight swelling on the right groin. The fever continued with very slight morning remissions, but without any material change, till the third day, when a dry cough came on, and on the 5th day she became delirious, the cough more troublesome, and the respiration quick and labouring. The bubo also, which had remained from the first, small, hard, and painful, then receded. She lies listless and moaning, respiration hurried, with loud mucous râle over the anterior portion of the left lung, skin dry and burning, pulse 112, weak and small; has headache, and shrinks from pressure on the *epigastrium*. The tongue is red and dry; thirst urgent;

bowels not opened since the attack ; for the last four days there has been some *subsultus tendinum*. Administered some rhubarb and Dover's powder, with five grains of sulphate of quinine ; ordered hot cloths to the *abdomen*, and oily frictions to the extremities. 1st *February*.—No report was made to-day by her people, and I did not see her again.

### CASE X.

31st *January*.—Boreo, a slight made Hindú girl, said to be fifteen years of age, but to appearance not more than twelve, was seized on the night of the 24th with fever, and pain in the left *axilla*. For five days the fever is described as having been very severe, but during the sixth and seventh days it abated in violence. It returned, however, last night with all its former strength, attended by delirium, and recession of the glandular tumour, which, from the first, had remained small and hard, but cannot now be felt. The skin is at present burning hot, pulse quick, but not deficient in strength, thirst great, tongue red and furred, is continually moaning and tossing about in bed, bowels opened once yesterday, being the only evacuation since the attack. Has some dry cough, and appears to suffer pain in the region of the heart ; is very dull, but quite sensible when roused. Gave of jalap, Dover's powder, and calomel, six grains each, in a little honey. 1st *February*.—Was very restless until after midnight, when the fever somewhat abated, and in the morning a perspiration broke out with some relief, and was followed by several hours sleep. The pulse is soft and regular, slightly accelerated ; bowels are opened, skin cool and moist, tongue pretty clean ; no appearance of tumour either in the *axilla* or groins. A dose of calomel and Dover's powder to be given in the evening. 4th. Her father came twice to my tent to report about her since the 1st, but I happened to be out, and did not see him until to-day. I find that she is rather better ; on the night of the 1st she slept well, but on that of the 2d, as

also during last night, there was considerable restlessness and delirium. Skin cool but dry, tongue clean, has no headache, tenderness of *epigastrium*, nor thirst; cough very trifling; bowels not opened since the morning of the 1st. The powder to be repeated as before. 5th, Is much improved, slept soundly through the night, bowels once opened, evacuation natural, skin cool, has no cough nor thirst, and expresses a wish for food. As I was leaving Pálí, I left a few powders of the kind first taken, to be given according to the state of the bowels, and have little doubt that she soon recovered.

#### CASE XI.

31st *January*.—Deramáh, aged 31, was attacked on the 24th with fever, which continued very violent for three days, remitted very remarkably on the fourth day, and again returned, but with less severity than before. He has some cough, which he describes as having existed before the febrile attack, but for the last three days there has been bloody expectoration. The skin is hot and dry, pulse 130, small and weak, tongue red, and furred in the centre, has much thirst, headache, and pain in the *epigastrium* and left *hypochondrium*, increased on pressure; the hypochondriac region is rather hard and tumid. His bowels have been four times opened since the attack, stools thin and watery. His countenance resembles that of a person in the advanced stage of *phthisis*, lips thin and florid. A mixture of salt, pepper, and ginger has been given him, besides opium at different times. His friends did not come for any medicine.

#### CASE XII.

*January 31st*.—Motíchand, a *baniyá* aged twenty-two, of spare habit of body, was attacked on the afternoon of the 29th, with fever, and pain in the right *axilla*; the fever has



since continued without remission, or any observable change. He now complains of frontal headache, great thirst, and slight pain of *abdomen* on pressure. The eyes are red and watery, skin burning hot, tongue clean and red, pulse 130, of moderate strength, bowels opened to-day, evacuation thin and yellow; no disturbance of the cerebral functions. Vomited once on the evening of the seizure, throwing off a good deal of bile. An emetic was given, and half a scruple each, of calomel and Dover's powder, left to be taken in the evening. 1st Feb. *Mane*.—He vomited only once after taking the emetic, which acted however five times on the bowels, producing copious watery stools, and a very alarming state of collapse. He now lies on his back in a state of complete exhaustion, and is with difficulty roused, vision indistinct, extremities cold, action of the heart weak, pulse very quick and indistinct at the wrist, respiration slow and suspirious. The swelling in the *axilla* disappeared in the course of the night. A mustard cataplasm was applied to the calves of the legs, and the stimulant quinine mixture with brandy ordered to be given in repeated doses. *Meridie*.—Has rallied considerably; pulse improved in strength; has very little tendency to *coma*; surface of the body moist, and nearly of the natural temperature. The mixture to be continued every three hours during the day, and five grains of calomel, with two of opium, to be given at night. 2nd. *Mane*.—Very little change; but what there is, rather for the better; no appearance of bubo. Tongue clean and moist, no thirst. The quinine mixture and powder to be given as before. 3d.—Had a quiet night, and obtained some sleep; bowels once opened, stool scanty, dark, and fœtid; is now quite sensible and collected, though dull and disinclined to answer questions; pulse 120, soft and small. To continue the quinine, and to have a scruple of Dover's powder and three grains of calomel at night. 4th.—The symptoms are much the same, but he feels better; has no pain nor swelling either in the *axillæ* or groins. Some of the mixture and a few laxative powders were left, with instructions how to administer them, and a light and spare diet strongly enjoined.

## CASE XIII.

1st *February*.—Rukhmí, aged about thirty-two, the wife of a Baníyá, was seized yesterday at noon with pain and swelling between the left *mamma* and *axilla*, where there is now a tumour of the size of half a small pigeon's egg, not particularly hard, but very painful. She complains only of great debility, languor and slight headache; pulse 95, weak but regular; skin dry and cool. Bowels opened yesterday; tongue clean, has no thirst. Applied a poultice to the swelling, and gave a powder, containing a small quantity of cinchona bark, with five grains of Dover's powder and calomel, to be repeated in the evening. 2d. Had slight febrile symptoms last night, but expresses herself better; the headache is trifling; the pulse only slightly accelerated, and the skin cool. The tumour is softer and less painful. To take the following powder thrice daily. *Pulv. Cinchonæ gr. xvi: Pulv. Ipecac. Comp. ℞ss. Calomelanos gr. ij.* 4th. Appears to be doing well; bowels regular; feverish symptoms nearly gone. To continue the powders.

## CASE XIV.

2d *February*.—Jíwá, a musalman, twenty-six years of age, was sensible last night of pain and hardness in the right *axilla*, and, at the same time, had an accession of fever. He admits that he felt out of sorts for a day or two previously; but asserts that the fever and pain in the *axilla* occurred at the same time. He now complains of frontal headache, anxiety and oppression about the *præcordia*, great thirst, and some tenderness of the *epigastrium* on pressure. The skin is dry and hot; pulse 120, soft and weak; tongue white and furred, had some vomiting during the night; bowels not opened for the last two days. Administered an emetic of ipecacuanha and mustard flour, and directed half a scruple each of Dover's powder and calomel, to be given two hours after. *Vespere*.—The emetic

caused moderate vomiting, the fluid ejected was slightly tinged with bile; the thirst and præcordial oppression are less; the other symptoms remaining much the same. 3d. Had some increase of fever last night; pulse 120, skin dry, but not particularly hot; tongue cleaner; bowels not yet opened; complains of some headache and thirst. The axillary tumour is about the size of a hazel nut, hard, moveable, and painful. To have the bark powders, as in the last case, every three hours. 4th. *Mane*.—Had a severe exacerbation of fever last night, attended with some delirium, but he appears at present much the same as yesterday; skin hot and dry, bowels still confined; pulse 125, soft and weak; has a good deal of thirst; tongue white and moist. Administered a small dose of jalap with calomel and Dover's powder. *Vespere*.—There is considerable improvement since morning; he has had two dark foetid stools of natural consistence; pulse 120; tongue cleaner; axillary tumour softer. To have sixteen grains of Dover's powder, and half a scruple of blue pill; to continue the cinchona powders as before, and to apply poultices to the swelling.

The above cases, as already mentioned, include all those *without* glandular swellings that came under my notice; and, in concluding them, it will be necessary to advert, shortly, to the nature of the obstacles which prevent a proper plan of treatment from being carried into effect, or even the employment of such remedies as are dangerous when improperly administered, or under improper management. At a distance of 120 miles from the nearest frontier station of the Company, in a disturbed and unsafe country, without a supply of medicines, or even a native assistant, and with a limited time only at my disposal, much could not be expected in the way of treatment; but, even had these objections been removed, there remained enough in the habits and circumstances of the people to render inefficient the best means that could be employed. No one could be persuaded to make early application for assistance, and not the least reliance could be placed



on any of the attendants, if left to give the necessary remedies; the only safe method being for the medical man either to administer them with his own hand, or decline giving them at all, except when they were such as could hardly prove hurtful. Even if the medicines were properly given, it was quite impossible to prevent the unfortunate patient from being stuffed, perforce, with food or drink of the most hurtful kind, or dosed with opium. As every European medical man was expected, by the credulous and ignorant people, to perform miracles, nothing could induce them to continue the remedies if a marked change for the better did not very soon appear; and, in such a case, they would be refused as unnecessary. In some instances, the death of the first sick person seen by the reporter in several of the towns, even when previously moribund, was sufficient to prevent his seeing another case. As the native Hakíms or Bêds pretend to be quite independent of any information to be obtained from the patients or their friends, and profess to understand, at once, the whole history and state of the disease, merely by feeling the pulse, the inquiries usually made by Europeans can only be looked on as marks of ignorance. All the Bêds, however, had betaken themselves to other places, soon after the disease broke out. Many common remedies, such as venesection, purgatives, and emetics, were strongly opposed; and often, I think, with reason; but, every thing considered, and seeing the little control I had over them, I did not think myself justified, either by the nature of the malady, or from other reasons, in attempting any active treatment, involving, perhaps, additional risk from the causes above mentioned.

Although it is only of late years that this disease has become known to European medical men, it is very probable, indeed I may say certain, that it has prevailed, at intervals, throughout Márwár, from a very remote period. Unfortunately, there is little known of the internal history of this part of India, owing to the want of authentic annals; and the only persons from whom information, in any degree to be relied on, can be obtained, are the Bháts or genealogical bards, and the

Jain priests. From inquiries made among the most intelligent of the latter class, it would appear that this is by no means a new disease. Mr. White mentions, in his report, that records are preserved, of its former visitations, at Sújet and Jôdhpur, the one twelve miles east, and the other about thirty miles north of Pálí. He says, also, that the province of Márwár “is traditionally believed to have been, at remote times, subject to the same scourge. The name of the country is that of death.” The last remark, however, is incorrect, as the name Márwár is not derived from the term “Maran,” signifying death, but from the Sanskrit words Már, a desert, and wár or wárá, a place, or district; and is, as every one must allow, quite descriptive of the general features of the province. It appears to have first attracted the notice of the Company’s officers about the year 1815, when it was ascertained to be raging at Kantákôt in Wágur, in the month of May; no affection of a similar kind having been traced as previously existing in any of the neighbouring districts; it spread gradually through Wágur, and proved very fatal in the months of January, February, and March 1816. In May of the same year, according to Mr. M’Adam, it appeared in the village of Múrví in Kattíwár, on the southern side of the Runn; in August it shewed itself again at Buchau and Chirú in Wágur; and, in the end of the year, was raging with great violence at Múrví and Buchau, as also at Ráhdinpur in Jutwár, and at Haïderábád in Sind’h. In 1818, according to Mr. Glen’s report, it appeared in Gogeh, on the western coast of the Gulf of Kámbay. From this period till the beginning of 1821, it prevailed extensively in Kattíwár, and Jaláwár towards Ahmedábád, but it is quite impossible to gather any certain facts regarding its manner of spreading, or the order of succession in which the different villages and districts were attacked; many of the reports offering on this point a mass of contradictions. For instance, Mr. Gilder says that when it broke out in Jaláwár, it first appeared at Dhollera in May 1817, spreading from thence over the villages of Bariád, Rajka, Piplí, Dundúka, &c., while, on the other hand, Mr. Glen

says that Dhollera was first attacked in 1820. The only thing that appears pretty well established is, that for a period of five years, it prevailed extensively in the above mentioned districts, sometimes in one place, sometimes in another; at one time almost disappearing, at another breaking out with redoubled fury; villages often remaining healthy in the very midst of others nearly depopulated, and being in turn attacked at a time when the neighbouring ones were comparatively healthy; the vicissitudes of the seasons, or changes of weather, not seeming to affect in any appreciable degree its progress or character. With regard to the numerous instances in which it is said, in the report of Mr. Glen, to have disappeared and broken out again repeatedly, at intervals, in the same place, I am afraid very little reliance can be placed on the correctness of such statements made by the natives, as they were frequently found asserting that the disease had altogether ceased at Pálí, and other towns in Márwár, at times when its violence was but little abated. Be this as it may, it seems well established, that from 1821 to 1836, it had not manifested itself in any part of the country, and was in fact almost forgotten. On its reappearance in Márwár, in 1836, it did not attract particular attention, until it had occasioned great mortality at Pálí, which led to the generally prevalent belief that it had first shewed itself in that town; it is, however, clearly established, that the first place attacked by it was the small village of Taiwáli, about 15 miles S. E. of Pálí, containing a population of nearly 600, chiefly employed in agriculture. This village is described by Mr. White as clean and airy, the surrounding country tolerably fertile, and free from jungle or rank vegetation; the disease appeared in the month of May, and soon carried off 150 inhabitants. There is no evidence to shew whether any of the places between Taiwáli and Pálí were attacked, but in the end of June, or beginning of July, it broke out in the latter place, in the quarter of the town inhabited by the musalman calico printers and stone cutters. For nearly a month its ravages are said to have been confined to the quarter just attacked, and it was not un-



til the Hindú merchants and shopkeepers became its victims, that a general panic and dispersion of the people took place. For three months its violence continued general, and almost unabated, after which it began to decline, owing in all probability to the deserted state of the town ; the better classes of the inhabitants having fled to Sújet, Jôdhpur, and Khairwá, within a circuit of from 20 to 30 miles from Pálí, chiefly to the east and north. By the middle of October, it was raging at all these places, and particularly at Sújet and Jôdhpur, and the inhabitants of these towns fled in turn to Pálí, where its virulence had been considerably diminished. On the 6th October it broke out at Walotra, its western limit, but on the 18th of the same month, it had not extended to the south of Taiwáli, where it first appeared. By the end of the year, it had reached the walled town of Jalôr, after shewing itself in the villages of Páwá, Búlí, and Chanôd, between that place and Pálí. Jalôr occupies what would be considered, and what had always been found, a remarkably healthy site, on an elevated rocky platform, at the base of a porphyritic hill, about 1000 feet in height. In November, many villages around Taiwáli, the original seat of the disease, and which had at first escaped its ravages, suffered severely ; it appeared at the same time within the N. W. border of Meywár, at the village of Lakôla, and soon extended to some distance in that province. In the beginning of 1837, it had spread to Budnawár and Seonagar, and on the 2d March it broke out at Jáliá, on the Meywár frontier, but within the province of Ajmír, and about 25 or 30 miles S. W. from Nasirábád. Before the month of May, Náthdwára, Potala, Gangápur, and many villages within a short distance of Udepur, were affected. Up to the beginning of 1838, when I visited Pálí, the disease had never entirely ceased in that town, being a period of one year and seven months from its first appearance there. From November 1836 to October 1837, the deaths were proportionally few, and the disease mild, but it then began again to increase ; and up to the time of my report, was still very prevalent and fatal, considering the half deserted state of the town.

It has generally been observed, or at least said, that the extensive prevalence of pestilential diseases has been attended by remarkable natural phenomena of various kinds, such as marked irregularity of the weather, or in the course of the seasons; failure of the crops, great mortality among domestic animals, or cattle, and such like. The appearance of the Kach'h and Kattiwár disease of 1815—21, had been preceded by great scarcity of food, and stagnation of trade and industry, chiefly from the course of political events; but this was not the case in Márwár, for although the whole of that province has been for long in rather an insecure and disturbed state, it did not affect, to any degree, the circumstances of the bulk of the people, and food was cheap and abundant. Neither had there been any unusual peculiarity in the seasons. It was said, and I believe with truth, that there had been a great mortality among the cattle, not only throughout Márwár, but in Mullání, and the desert country to the westward, occasioned by a complaint differing from the epizootics usually observed;<sup>a</sup> but these reports were often vague and unsusceptible of sufficient proof to be quite satisfactory.<sup>b</sup> The most singular phenomena remarked in connection with the breaking out of the disease, and adverted to in Mr. White's report, was the death of all the rats in the village of Taiwáli, during the latter half of April, and just before its first appearance. He says, "They lay dead in ~~all~~ places and directions, in the streets, houses, and hiding places of the walls;" and that "this death of the animal attended or preceded the disease in every town that was attacked in Márwár, so that the inhabitants of any house instantly quitted it on seeing a dead rat." If this can be credited, it is certainly a very extraordinary circumstance; it is not mentioned, however, by any of the other

<sup>a</sup> The name given to this epizootic in Mallání, or the S. Western part of Márwár, was "Munh," i. e. "*the mouth*;" the most prominent and characteristic symptom being a copious discharge of viscid fluid from the mouth and *fauces*, resembling a profuse salivary flux.

<sup>b</sup> About Balmir, an unusual mortality among poultry was remarked during the years 1836-7.

reporters, nor did I hear any thing of it at Páli; at the same time, it is not likely that such a report would be invented without any very evident object.<sup>a</sup>

Of the relative degree in which the different classes of the population suffered, we have not such accurate information as could be wished. In as far as could be learned, however, it would seem, that on its first appearance in any place, the strong and robust suffered in an equal degree with the weak and infirm, but that when its first fury was spent, a great proportion of the sick consisted of women and young persons; this may have been more apparent than real, as there is reason for believing that women recovered more frequently than men. In a great number of instances whole families, from the oldest to the youngest, were attacked, and when it was once fairly introduced into a street or quarter, all the residents suffered more or less. Considerable discrepancy exists as to whether the Mohammedans, Rájputs, or other classes of Hindús were most liable to its attacks, and the cause of this difference may, I think, be satisfactorily explained, if we consider the state of society in the districts affected. In the large towns, such as Páli, Jôdhpur, &c., the population offers a great variety of tribes and castes, each having its distinct quarter, and differing from the others in customs and manner of living, while in the villages this variety is not so observable, as the entire population of some of them consists of one class, as Rájputs, Brahmans, Baniyás, Chamárs, and the like. In the large towns, when the disease obtained a footing in a particular tribe or trade, it generally ran through it before pervading another; in the small villages it is evident that sometimes Rájputs only, and at others Baniyás, would be the sufferers. Upon the whole, however, it appears, that though there are instances of the Rájput population of a village suffering severely, as at Múli, (White,) yet they were generally less af-

<sup>a</sup> The epidemic which prevailed in Kumáon, in 1834-5, was preceded, according to Mr. Gowan the Commissioner, by a great mortality among the rats in the villages. Dr. Ranken's Report, p. (229.)



fectured than the other classes, and sometimes escaped altogether, as at Múrví and Sumári; this immunity may be in some measure accounted for, by their inhabiting the cleanest and airiest parts of the villages. Some of the reporters assert that those who used animal food, as the Mohammedans, and many of the Rájpúts, suffered in a slighter degree than the Brahmans, and Baniyás, who use a strictly vegetable diet. In 1819 the Bohoras, (dealers in cotton cloth and a Mohammedan sect,) were chiefly affected at Múrví, the same was, in a greater measure, true at Sílá, as out of 120 who died, 60 were of that class; it must be remembered, however, that they constituted a great part of the population at Páli and many other places; the disease first appeared among the calico-printers, who are all Mohammedans, and committed great ravages, but when it had fairly spread in the other quarters of the town, it was fully as destructive to all classes. It would certainly appear that oilmen enjoyed a degree of immunity, although the evidence on this point is rather defective. On leading the conversation to such subjects, I heard no statement made either against or in support of this supposition; and in making such inquiries great caution must be used lest the questions suggest the answers. Mr. M'Adam says that during the Kat-tíwár disease, the natives believed that oilmen were not liable to infection. Mr. Whyte remarks that one of the families which suffered most severely at Múrví was an oilman's; at Múlí, however, only one of this class died out of 50, and Dr. Irvine heard of two oilmen dying at Jáliá.<sup>a</sup> The most general inference from all the reports seems to be, that among all classes, especially in small villages, the mortality was nearly equal.<sup>b</sup>

<sup>a</sup> Mr. Whyte found, on inquiry, that no immunity was said to be enjoyed by oilmen, tobacco-nists, or chamárs, (tanners.)

<sup>b</sup> Aubert gives the proportion of deaths to the number of sick in the Alexandrian plague of 1835, as follows:

	No. of cases.	Cures.	Deaths.	Mortality per cent.
Europeans,	32	8	24	75
Arabs,	109	76	33	30
Turks,	8	4	4	50

Among the negroes no recoveries were seen.

The mortality occasioned by this formidable scourge was, as may be supposed, very great. In the Kattíwár visitation very few of the sick recovered (M'Adam), and Mr. Whyte says that in this respect "it might justly claim pre-eminence over most of those epidemics of which we have a history." In Múrví, containing a large population, only four men who had recovered could be found by Mr. Whyte. But the truth is, that we have no accurate means of ascertaining the rate of mortality, or even of making such an approximation to it as would deserve confidence, at least by resting our estimate on the reports of the natives, and still less by basing them on a hurried observation of towns and villages in a half deserted state. The population of Pálí before the breaking out of the disease, is stated by Mr. M'Lean at 15,000, upon what authority he does not mention; I am convinced, however, that this is not one half the real number. The Hákem or governor, and other men of authority there, gave the inhabited houses at 10,000; the disproportion between which and the population allowed by Mr. M'Lean, is at once evident. From repeated careful observation and inquiry, I am certain that this number of houses is very little if at all exaggerated, and that 9000 is a safe estimate; this, at the average of  $4\frac{1}{2}$  souls to a house, which is probably nearly correct, and considerably below that of many villages, would give upwards of 40,000. Sir Alexander Burnes, who had the best means of information, states the population of Pálí in 1830 at 50,000; this is perhaps too high a number for the houses given, but the population had certainly not decreased in the intermediate years, on the contrary, it was generally supposed to have been augmented. The deaths that had occurred up to October 1835, only four months after its first appearance, and more than two months after the bulk of the population had fled, were stated at 4000, and in February 1838 I was told that the number amounted to 10,000 of all ranks and classes. This is no doubt much exaggerated, but if we reduce it to 7000, or less than two-thirds, we shall still have a mortality quite unprecedented, as occurring probably in a moiety of the original population. Nor would

it exceed that observed in the other towns and villages, as may be seen by the following extracts from the reports. At Rámghur, 70 died out of 100 sick, (MacLean); in Jáliá, 600 to 700 out of a population of 4000, and, in the same village, though 1000 only remained in their houses, the deaths, in March 1837, averaged 16 daily, (Irvine). At Lakóla, out of 600 or 700 inhabitants, 200 deaths occurred in ten weeks; at Lakmineas, 14 out of 100 in two months; at Sumárí, in one month, 80 out of 1000; at Máundera, in two months, 500 out of 1000, (Keir); at Rínchôr, in ten months, 270 out of 1500, (Dr. Russell). In Gangápur, containing 540 houses, there were 400 deaths in six weeks; at Punáhan, 500 houses, 250 died in two months; in Móhí, from 200 houses there were 300 deaths in two months; in Brahman Píplí, 40 deaths, in three months, from 200 huts; at Kothariya, 200 deaths out of 700 inhabitants; at Dendá, 300 died out of 3000 in a few weeks; with numerous similar statements. A comparison of the different reports would tend to fix the mortality for a long period, as a year or more, at 20 per cent. of the whole population of the places affected, and certainly at not less than 60 per cent. of those attacked, shewing a degree of fatality which is certainly unequalled. It was not an uncommon thing for large families to be entirely cut off. At Lakóla, the number of recoveries was calculated at thirty only, and Dr. Keir saw one patient, the sole survivor of a family of seven, and likely soon to fall a victim in her turn. At Gangápur, twelve only were said to have recovered, out of between 300 and 400. During the first period of the prevalence of the disease in any place, and at other occasional periods, when it shewed increased virulence, recoveries were rare, and sometimes almost unknown; but, after its height, and during the decline, the deaths bore a small proportion to the number of sick, and recovery, though tedious, was the general issue. The total number of deaths, said to have occurred throughout Márwár and Meywár, including, of course, the populous city of Jôdhpur, has been stated so high by the natives as



100,000, and by Dr. Irvine, in the end of 1836, as not under 80,000. I would be inclined to make it at least 60,000 up to 1838; as it is well known that, in all semi-civilized countries, as Turkey, Egypt, and the greater part of India, where the amount of population is unknown, and no census taken, the deaths by plagues, famines, and such like calamities, are often stated at more than the actual number of inhabitants.<sup>a</sup> Up to 1837, Colonel Alves reckoned the number of deaths in Márwár at 20,000, including 6000 in the city of Jôdhpur, and Colonel Spiers estimated those in Meywár at 7022. Rep. p. 4, 5.

From what has been already said regarding the impossibility of enforcing any plan of treatment, it may be supposed that little of a satisfactory nature can be produced as to the employment of remedies in this disease. The Bêds, or native physicians, if they attempted to combat it at all, did not think proper to interfere until the fifth day, when the greater part of the sick might be pronounced out of danger; and the means then used were, for the most part, local, consisting of leeches, fomentations, poultices of leaves, or of flour and opium to the glandular swellings, or compositions of onions and turmeric, capsicum, juice of the mudár or *calotropis*, or even arsenic, and occasionally the actual cautery. The chípas are said to have tried venesection, but without advantage, as might be expected from the way in which it is gene-

<sup>a</sup> As examples of such statements, the following may be cited. Mr. G. Baldwin, formerly consul at Alexandria, says that the plague, in one year, carried off upwards of a million of souls, chiefly in Middle Egypt and the Delta. Now, the present population of Egypt, from the sea to the first cataract at Eswán, does not exceed 1,800,000, and, at the period spoken of, could not have been much more than two millions, therefore the improbability of a moiety of the inhabitants having been carried off by a disease, only partial in its operation, is at once evident. We are told by Ray, that in 1580 plague prevailed at Qáherah, (Cairo), to such a degree, that there died above 500,000 in six or seven months. Qáherah, however, never contained so many inhabitants, and its present population does not exceed 255,000.

rally used by Eastern practitioners; they never abstract, in any case, but the most trifling quantity of blood, without any reference to the effect produced. Purgatives are said to have been seldom used, indeed I believe never, and were strongly exclaimed against as hurtful. The only one of the Reporters who professes to have treated the disease to any extent, or with any degree of success, is Dr. Irvine; but he does not tell us what the treatment consisted in, except in one or two fatal cases. He says, "Of those treated by me, about thirty have recovered, I say 'about' thirty, as I kept no register; one recovered by only lancing the bubo." As Dr. Irvine's stay at Jáliá extended only from the 2d to the 9th March, the possibility of ascertaining, or being at all certain of the issue of any number of cases, is very doubtful, and the efficacy of the treatment is apt to be questioned, when recovery is attributed to evacuation of the contents of a matured bubo. The remedial measures most generally recommended by the Reporters are—in the commencement of the disease, bleeding, general or local, or both conjoined, according to the symptoms; emetics, purgatives, diaphoretics, and, in short, the means most generally used in typhoid fevers, with the additional use of bark and stimulants when the remissions are distinct, or in the latter stages. But, as has been seen, the efficacy of a properly conducted treatment is only conjectural, and nothing has been done in the way of cure to warrant us in drawing strict conclusions. In the first and fourth varieties, it appears to me that very little success can be hoped for from any plan of treatment, and even in those of the second class, that any very active interference is often of questionable utility after the second day, except for the purpose of combating occasional symptoms. The depression of the vital powers is so evident throughout, that any measures, having a tendency to increase it, are likely to induce fatal collapse. Strong purgatives are often dangerous, and emetics are frequently liable to the same objection. Venesection, in the great majority of cases, could scarcely be thought of except at the very commencement;

perhaps, in those where the attack comes on with much excitement and delirium, the pulse being moderately full and strong, well regulated venesection might prove highly beneficial, but none of those cases came under my notice, and they are probably rare. Case 6th appears to have been one of this description, and the loss of blood, from the accidental wound on the head, seems to have saved the patient for the time. The following is the general plan of treatment I would be inclined to recommend in ordinary cases. If the patient is seen at the time of the attack, or during the first day, to empty the stomach by a stimulant emetic, and follow it up by a full dose of calomel and Dover's powder, using the mercurial ointment at the same time to the inside of the thighs and arms. Should there be any remission of the fever in the morning, quinine to be given in combination with calomel, and the Dover's powder. If the bowels be very costive, or more than two days without having been opened, a little jalap or rhubarb, conjoined with hyoscyamus, or the evening doze of calomel and Dover's powder, would prove a safe and sufficient laxative. When much tenderness or congestive pain were complained of at the *epigastrium*, sinapisms appeared to give relief, and blisters would no doubt prove highly serviceable.<sup>a</sup> With prompt removal of the sick to an open and pure air, the amount of mortality would no doubt be much diminished.

<sup>a</sup> The following is an abstract of the results of the treatment employed by Dr. Aubert, during the Alexandrian plague of 1835, chiefly at the Arab hospital of Rás el Tín, and the European hospital, in conjunction with the late courageous, and enthusiastic Rigaud. Of forty-four patients submitted to simple (dietetic) treatment, there died, five Europeans, five Turks, and three Negroes, while the rest, all Arabs, (31) recovered. In fifty-three cases treated by bleeding and antiphlogistics, ten Europeans, thirteen Arabs, three Negroes, and one Turk died; while twenty-one Arabs and five Europeans recovered. Emetics were chiefly employed in seventeen cases, of which, four Europeans and four Arabs died, and eight Arabs and a European recovered. Seven cases were treated with half-grain doses of phosphorus; of these five Arabs recovered, and an



In considering the causes and origin of the disease, and the circumstances connected with its diffusion, it must be premised, that, notwithstanding the accounts given by the reporters of its first manifestations at Wágur in 1815, and Taiwáli and Páli in 1836, it had made very extensive advances in both instances before it excited much attention among the inhabitants, and long before it attracted the notice of Europeans; consequently, all assertions regarding its first period must be either conjectural, or supported by very insufficient evidence. As Mr. M'Adam, however, justly remarked in 1816, " Until accounts are received to disprove the opinion, it must be

Arab and European died; the phosphorus appeared in some to induce *enteritis*. The actual cautery was applied over the spine in twenty cases, in the last stage of the disease, and, as a *dernier ressort*, but, as might be expected under such circumstances, only two Europeans and three Arabs recovered. Of eleven severe and almost hopeless cases, in which Hashish was employed, seven recovered, but in some bleeding was necessary to subdue *pneumonia*, apparently induced by that remedy. The Hashish is an extract variously prepared from the hemp, or *Cannabis sativa*, and known in India by the names of Bháng, Sabzeh, or Gánjhá; it has been used from time immemorial all over the east, as a substitute for opium, in producing intoxication. From the use made of it by the followers of Hasan Sab'a, to induce the state of frenzy in which they committed their murders, they received the name of *Hashíshín*, corrupted by the Franks into *assassins*. By the last accounts from India, it would appear that Dr. O'Shaughnessy has employed the Hashish with success, in *cholera spasmodica*, in the form of tincture; it is beyond doubt a most powerful remedy, and may become a very valuable one.

Since the above was written, I have had an opportunity, through the kindness of Professor Christison, of seeing Dr. O'Shaughnessy's pamphlet on the *Cannabis Indica*. The account there given of the physiological action of the Charras, or resin of the plant, agrees in most particulars with M. Aubert's description of the effects of the Hashish. It produced increased quickness of pulse, determination of blood to the surface, bulimia, uncontrollable laughter, and a succession of vivid and pleasurable ideas, aphrodisia, loquacity, and sometimes catalepsy. It appears to have been of service in epidemic cholera, but its most striking remedial effects have been observed in traumatic tetanus, and infantile convulsions; a majority of the cases of tetanus in which it was employed having terminated in recovery.

considered to have originated in Wágur," and the same is true of its appearance at Taiwáli. That it was an imported disease certainly no proof can be offered, although it must be allowed that its existence at Haïdarábád about the same time, or perhaps antecedently to its appearance in Wágur, permits the supposition of its having proceeded from Sind'h. A similar sickness is said to have prevailed in the mountainous district of Kumáon, in the north of India, for fifteen years previous to 1836, and which is said to have proved particularly fatal in 1834-5. It is described by the resident commissioner there, as "ushered in with fever, great prostration of strength, and an eruption of buboes or glandular swellings over various parts of the body. It proved rapidly fatal, its duration in many cases not exceeding three or four days."<sup>a</sup> It was not seen by any medical man. That this disease, however, could have been conveyed for a distance of 600 miles, through some of the most populous parts of Hindústán, to a small and obscure village in Márwár, leaving the intermediate portion of its tract untouched, is hardly within the bounds of probability. For many years no plague had been known at Kosair or Sús, on the west and north shores of the Red Sea; and it never prevails on the Arabian coast at Jiddah, Mokha, 'Aden, or Makallah.<sup>b</sup> For some years prior to 1832, plague had been steadily advancing from Asia Minor, through Mesopotamia, Irák, round the head of the Persian Gulf, and along the Persian coast, desolating the cities of Diyárbekr,

<sup>a</sup> Dr. Ranken's Report, p. (230).

<sup>b</sup> It is mentioned, however, by Burckhardt as having prevailed at Yenb'o, the sea-port of Medíneh, in April 1815, having previously been raging at Jiddeh and Mekkeh: it was said to have been brought to Jiddeh from Sús. Medíneh, as well as the villages between Yenb'o and Jiddeh, remained healthy. Notwithstanding the attempt of M. Aubert to shew that Burckhardt was mistaken, there is no good reason for doubting that it was the plague; but, as it had not been known in Arabia within the memory of man, the bigoted Arabs denied the possibility of its existence, afraid of losing the annual harvest of gain which they reap from the pilgrims that resort to the holy cities.

Mosul, Baghdád, Basrah, and Abúsheher,<sup>a</sup> at which place it ceased, or was withdrawn from European observation, in the summer of the year above mentioned. As we know but little of the wild and savage country between the eastern limit of Persia and the mouths of the Indus, and are quite ignorant of what may have been passing in the interior, it might be thought by some that it had advanced through Kermán and Mekrán to India; but, without direct evidence, the supposition is, of course, gratuitous.

If we discard the idea of its importation, we shall still find ourselves as much in the dark as to the local causes which could have concurred in producing it. Neither Kantákôt nor Taiwáli exhibit peculiarities in soil, situation, or climate, when compared with innumerable other towns and villages, not only throughout Márwár, but India generally; if any difference, indeed, was observed with regard to Taiwáli, it was, that it was free, in an unusual degree, from what are supposed to be common causes of pestilential and epidemic diseases, and fevers of every kind, for, according to Mr. White, “the streets of the village were very clean and airy;” the inhabitants chiefly employed in agriculture, and the surrounding country free from marsh or jungle. This difficulty of accounting for its origin, is further increased, when we consider the season of the year in which it appeared, at the time the heat is greatest, the dryness of the air extreme, and the country almost free from sickness of any kind; the same remarks apply to the month of June, when it shewed itself

<sup>a</sup> It is often asserted that plague is unknown in Persia; but no one who saw the city of Búsheher, the principal sea-port of that country, towards the autumn of 1832, can ever forget the scene of utter ruin and desolation which it presented after the visit of that dreadful scourge. Nothing was to be seen but houses in ruins, deserted streets, numberless wells choked up with rags and rotten bedding, and half covered pits, into which the dead had been hurriedly thrown, and into which the unwary passenger stumbled at every turn; while, in the environs of the town, a heap of stones, or mound of earth, covered with rags, marked the last resting place of many a miserable victim who had dragged himself there to die.



in Pálí. It is evident that, in order to form a just opinion of the causes of its local origin, or the conditions accompanying its extension, we must divide them into two classes;—those which are generally prevalent, and those which are partial or local. Among the first are placed the temperature and state of the air, as to moisture, electrical condition, and the force and direction of the winds. From these we gain little assistance in explaining what is obscure; the utmost that can be said being, that in the autumn, winter, and spring months, but especially in the first, when the average temperature of the air is lower, and the extremes greater than in summer, the quantity of moisture increased, and the winds less strong and more irregular, the spread and mortality of the disease were, on the whole, greatest, the rapidity of its extension being, however, then more remarkable than the increase in the rate of mortality. In the class of partial causes or accompanying conditions, some are permanent, while others are merely temporary or occasional; some of the first kind are so prevalent that they might almost be considered general throughout Kach'h, Kattíwár, Márwár, and Meywár. These are confined and ill-ventilated houses, and the abominably dirty habits of the people, both in their persons and dwellings. This is so universal, that in describing any place as clean, the reporters can only mean that it was less dirty than usual. Mr. Whyte's description of the inhabitants of Kattíwár will give a good idea of their beastly condition. He says, "They are the only people whom I have seen in India who might properly be termed filthy. Ablution, which, from being sanctioned and enjoined by divine authority, in every other place is practised with all the diligence and scrupulosity of their other religious ceremonies, in Kattíwár, from what cause I know not, is almost wholly neglected;—the evil consequences of this neglect are much increased by the enormous quantity of clothes which it is the fashion for all ranks to wear; and, in most ranks, these clothes are but seldom changed. In some of the inferiors, it seems almost as if they were allowed to rot upon the persons of their owners without once being

washed, or even being removed from their first being put on, till they can no longer serve the purpose of covering their nakedness." Mr. Glen also says of the people of Dhollera, "They are the dirtiest race I ever saw, they wear large quantities of clothes, which are not changed until they drop off, rotten with filth." "The filth is, as it were, engrained in their skins." The only people I have ever seen so universally dirty as the Márwáris, are the Arabs, among whom a garment is never changed or washed, until it drops in pieces from their bodies; but scanty clothing and constant residence in the open air, are advantages on their side. It appears to me, however, that the people of Márwár are not much worse, in this respect, than the lowest ranks of all countries; but, with the essential difference, that among them it is not caused by want or misery, and pervades all classes, from the highest to the lowest, in a greater or less degree. The streets and houses in all the large towns and villages of Márwár, are, like all others in the East, narrow, confined, and ill-ventilated; generally abominably dirty, with collections of all kinds of filth and rubbish in and around them. Every village is not only hemmed in with a hedge or enclosure of dried thorns, *euphorbia*, or *cactus*, but the houses are also surrounded by them, enclosing numbers of cattle, often under the same roof with the family. Dead carcasses of cattle encumber the outskirts of the villages; most of the places, according to Mr. Russell, were of the meanest and most filthy description, with pigs, cattle, diseased dogs, and dunghills, at every turn. The truth is, however, that the same may be said of most Indian villages; I can vouch for its being the case in Gújrát and the Dukhun, and even to a sufficient extent in those parts of the island of Bombay inhabited by the natives.

It may be supposed, that exhalations noxious to health arise from the richly manured and irrigated wheat fields in the neighbourhood of the towns and villages, and we accordingly find, that ordinary intermittents are pretty frequent in autumn, and during the cold season, with an occasional case

of mild remittent ; but these never prevail to a greater degree than they do at these seasons throughout India generally, but, on the contrary, are less common, and Mr. Whyte says, that he found every one of the towns which he visited in Kattíwár, free from jungle, and paludal or animal effluvia. The brackish quality of the water in many places, has been said to predispose to, or produce disease ; that the saline impregnation sometimes occasions slight *diarrhœa* for a day or two among strangers, is no doubt true, as I have had frequent occasion to observe at Balmír ; but there is no reason for thinking that it is productive of any morbid change in the bodies of those accustomed to its use. Some have assumed as causes of the disease, the effluvia proceeding from rank and decayed vegetation, the exhalations from salt marshes, and famine and want ; but assuredly, before these are admitted, it is necessary to prove their existence. The reports of all who have seen the localities of the disease, represent them as comparatively destitute of vegetation, but that promoted by artificial irrigation from wells ; the small extent of which must be evident, when the labour is considered, and in many instances they are described as absolutely sterile. In part of Kattíwár, there is considerable fertility, but no rank jungle or forest. In a notice on Dr. Ranken's volume, in the Edinburgh Medical and Surgical Journal, the chief produce of Márwár and Meywár, is represented to be reeds, and is taken as a proof of the wet and marshy nature of the country ; nothing can be farther from the truth, for I can safely say there is not a reed in the whole tract, almost the only product being a coarse dry grass, a variety of the scented grass, or *Andropogon muricatum*, which grows only on dry and arid soils ; and, as has been said already, it is only in the dry beds of the torrents that water is found near the surface, the wells in other places being sunk to a depth of from 80 to 250 feet. Exhalations from the salt marshes have been blamed, but a sufficient answer to this is, that in their immediate neighbourhood the inhabitants are healthy, as well as the people employed in making the salt. These tracts are bare and destitute of grass or herbage, the



disease was uniformly most destructive at localities at some distance from them, and among the villages surrounded by the salt Runn at Panchpadro it did not appear at all, though it had been raging at Walotra, not far distant. Famine, as has been already noticed, did not occur previous to, or at the same time with the disease at Pálí; but is said to have preceded its appearance in Kattíwár, in 1815. Even if all the cognizable circumstances above alluded to, are allowed to operate in their fullest extent, we cannot say that they are sufficient to account for the origin of so extraordinary and peculiar a disease, and there is something essential still wanting, or unobserved, and the causes of the immunity of places adjoining the affected districts, where the physical state of the country, and the condition of the inhabitants were identical, are hidden from our view.<sup>a</sup>

As the origin of the disease in Kantákôt and Taiwálí, cannot thus be explained, it remains to be seen, whether its appearance in the places successively attacked, or the phenomena of its extension, can be accounted for by what is commonly called contagion, either mediate or direct. Many of the assertions that have been made, to the effect that its course could not be traced from one village to another, are of little value, the time for so doing having gone by before the in-

<sup>a</sup> In a note appended to Dr. Russell's report on Rínchôr by Dr. R. H. Kennedy, then superintending Surgeon N. W. Division Gújrát, and now a member of the Bombay Medical Board, he justly remarks, on the assertion of its entirely local origin in Rínchôr, that "one simple and brief answer suffices for this; had the disease originated in local causes, and not in contagion, it must have broken out simultaneously throughout Márwár and Meywár, the same causes operating to produce the same effects every where alike under the same combination of local peculiarities and atmospheric changes; but as the disease commenced at Pálí in June 1836, and from thence to August 1837 has been spreading first in one direction, then in another, destroying village after village, through Márwár and Meywár, commencing, raging, and ceasing, in all states of temperature and all varieties of locality during the fifteen months of its continuance, I cannot comprehend how one can refer such an epidemic to local causes." (September 1837).

quiries were instituted. By those who support its non-contagious nature, the arguments chiefly urged are ; want of proof of its importation ; the immunity of many places within the affected districts ; the frequent escape of those having intercourse with the sick ; its limited extension ; and lastly, its not being kept within certain bounds by sanitary measures. The first of these has been already noticed and allowed ; the escape of one or two places, such as Múrbá near Múrví in Kattíwár, and the district of Mhairwára, seems certainly to be connected with their high and airy, or hilly situation, but this will not explain the immunity of places not so favoured. The assertion, that those having intercourse with the sick did not suffer in a greater degree than others, was probably true in a few hastily observed instances ; but its general truth is disproved by abundant testimony to the contrary. That it was limited in its extension, is a fact, the cause of which is likely to remain hidden from us, but which, if revealed, would make us acquainted with the essence of the disease ; it is within these limits, however, that the phenomena of its propagation must be considered. Allowing that any disease could be propagated by contagion, it is not at all extraordinary that a few horsemen, placed at wide intervals, along an extensive line of country, did not prevent its introduction ; the only surprising thing would have been, the exclusion of it by such means ; and, indeed, any attempt at forming an efficient *cordon sanitaire* in the interior of such a country as India, can never be other than a failure. It has been said, that the idea of the disease being propagated by contagion, was never entertained by the natives ; but this cannot be reconciled with their numerous accounts of its introduction into their villages from infected places ; their general apathy and indifference would frequently lead them not to observe it, and their idea of the disease being a direct infliction of some of their numerous gods, would tend to keep them from believing it, even if apparent. It seemed to me quite clear, that when the natives are said to have denied its communication, by what the reporters called contagion, they denied only its communication

through the medium of the atmosphere, and not by direct contact of the diseased person. The words “*úran*” and “*úrtá*,” which the reporters have translated “*contagion*,” mean literally “*flying*,” *i. e.* in the air, as a bird; and can only apply to that mode of extension of a disease which has been called infection, or epidemic influence. The objection made in the India Review to its being diffusible by contagion, viz. that it was on the decline in Márwár, only deserves notice for the novelty of the idea, that diseases propagated in that manner ought to go on increasing “*ad infinitum*.”

It now only remains to give what evidence has been collected on the other side of the question. In 1815 it spread from Wágur as from a centre, and from Kantákôt as the centre of Wágur, (M'Adam). Gradually advancing to the east, it had reached the villages about Dhollera in 1817. In 1820 Mr. Gilder says, “it was introduced into the village of Bullôl in the end of December last, by a Baníyá of the place, who had returned from Deopúra, where it was raging at the time. The night after his return, he complained of great uneasiness, pains in his loins and joints, attended with fever; these symptoms continued increasing throughout the night, and next morning he perceived swellings of his inguinal glands, which were exceedingly painful: during the day he became delirious, and complained of intense thirst; no abatement occurred on the third day, and in the evening he died. Every person belonging to this man's family, both male and female, died within the space of ten days, of the same disease, which spread to the only other two Baniyan families in the village, and committed similar ravages. After remaining about fifteen days from its first introduction, during which period it destroyed about thirty of the inhabitants, out of a population of 200, it disappeared.” In 1836, for a short time after the sick from Pálí fled to the other towns and villages previously free from sickness, the disease did not manifest itself among the inhabitants of those places, and only some of the refugees died; very soon, however, those who had most intercourse with them, (Baníyás for instance), began to suffer, (M'Lean). At Jálíá,



some were attacked in the jungle after leaving the town, from carrying their sick with them, (Irvine). It was reported to have been brought to Jalôr by a sick Baníyá from Pálí, whose family afforded the first victims, and from which, in eight days, it was diffused over the town, (White). At the village of Jât, a Baníyá went to Bhílwára to sell iron, remained there eight days, and returned complaining of headache and giddiness; he got worse, with delirium, fever, swelling of the glands, and died on the third day. Four males and two females, his relations, residing in the same house, were similarly attacked, and died from the 2d to the 4th day. All the other casualties, amounting to thirteen inclusive, occurred among Hindús in the same street, but there it stopped. In the village of Behgú, it first shewed itself in the end of February 1837, in a Baníyá who had come from Jât, where it was raging, to see his relations; the other individuals caught it from him, and seventy died in twenty days, when it ceased. A Baníyá went from Gangápur to Pálí, while the disease was raging there, to purchase cloth, and remained eight days; he returned ill of fever and inguinal bubo, and died in two days. His relations, nine in number, in the same house, and previously in perfect health, were all attacked, and all died after a few days illness with buboes; it then ceased. Four months after, it again broke out without any apparent cause. A girl arrived at Potela from Bhílwára, about the beginning of April, with fever and swelling of the glands of the neck, and died next day; a Baníyá, previously in good health, who attended the funeral, and touched the body, was seized with fever, and died in thirty-six hours from the attack, with buboes; it then spread over the town, (Russell). In many instances the natives evinced a dread of communicating with places in which it was prevalent, which can only be accounted for by their conviction of its communicable nature. Upon the whole, I think that the conclusions that can justifiably be drawn, from what has been said, are—that there is no proof of its being an imported disease, and that the conditions essential to its production are unknown; that there are strong grounds for

thinking it communicable from sick to healthy individuals, by actual contact or close proximity, but not through the medium of the air, even at moderate distances, in open situations, nor by means of *fomites*,<sup>a</sup> and that its ravages are remarkably checked in any town by dispersion of the inhabitants.

The remaining point to be considered, and which has given rise to much discussion, is, whether the term plague, *pestis*, is the proper name for this disease, and whether it is identical with, or differs from, the plague of the Levant? The settling of this question may be much simplified and facilitated, by discarding all irrelevant speculations relative to diseases which, in former times, have been called plague, but which were often widely different in their nature from the one now well understood by that name. I think I shall be able to shew, that this disease is identical in its nature with plague, as described by Russell at Aleppo, by Sir J. M'Grigor in Egypt, and more recently by Bulard, as prevailing at Alexandria, Cairo, Smyrna, and Constantinople. Moreover, having personally visited, and made many inquiries in all these cities, besides many others which have been frequently ravaged with the plague, as Siwás, Tokát, Diyárbekr, Mósul, Baghdád, Bussorah and Abushehr, I may be allowed, at least, to have had opportunities of forming a just estimate of the value of the facts to be brought forward.

It is said that most of the external appearances accounted pathognomonic of plague, as carbuncles, weals, or *vibices*, spots, and lividity of the body after death, were not seen in this disease. In the Aleppo plague of 1762, Russell found that in 2700 cases of what are called pestilential eruptions, 85 only had carbuncles simply, and 405 a concurrence of

<sup>a</sup> Dr. Ranken very justly rejects the idea of its introduction by *fomites* conveyed to Páli by the retinue of Zeráwer Mall, the Hindu merchant, but we are left in the dark as to the situation of the temple of Teeruth, spoken of in the report, (p. 28). There is no place in the west of India so called, in so far as I can ascertain; the word Tíráth or Tířth, being applied indiscriminately to all celebrated temples, or holy places to which pilgrimages are made, and often used to signify the act of visiting such a holy spot. Perhaps the temple of Dwárka is that alluded to.

carbuncles and buboes. But Russell, like many others, includes under the head of carbuncle, many which ought rather to be termed furuncles, or cellular abscesses. In the plagues of Alexandria in 1833, and of Cairo in 1837, Bulard found that of thirty-seven fatal cases admitted into the general hospital of the marine, and hospital of Ezbekiyeh, three only had carbuncles of any description, and only one was seen in twenty-three patients that recovered. M. Bulard also remarks that boil, or gangrenous pustule, would be a more correct name for many of them, and that they were not unfrequently so slight, as to dry up in three or four days after their formation, a small speck of the epidermis only having been destroyed. In the Egyptian plague of 1798, carbuncles were very rare. In the Cairo plague of 1835, the most distinct testimony is given by Dr. Aubert of the rare occurrence of carbuncles; they were only observed in four out of fifty-five cases which he gives in detail, and he expresses his opinion, that patches of extravasated blood have been often mistaken for them, by careless or ignorant observers. *De la Peste*, p. 253.

From these facts, the only conclusion that can be drawn is, that carbuncles, instead of being primitive symptoms in plague, are altogether secondary, and in many localities comparatively rare; and this, I think, can be easily explained. In many large cities in the east, frequently visited by plague, as Aleppo, Mósul, Baghdád, Bussorah, Isfahán, &c., the population constantly suffer from a disease which may be called indolent and malignant furuncle, often closely resembling carbuncle, and known by various names, as the date boil, Bussorah boil, *Mal d'Alep*, or *Atesh Fársí*, (Persian fire), which are all identical, but which have been confounded with the malignant pustule produced by morbid animal matter. They have, however, no such origin, but are in the strictest sense endemial, affect all classes of the population, old and young, sometimes even children at the breast, and are so universal, that scarcely an individual can be found who has not suffered from them, and who does not bear their marks, in unsightly



scars on the face or extremities.<sup>a</sup> Among the natives of India such affections as boils or carbuncles are exceedingly rare, owing, probably, to their mild, unstimulating diet, and we can easily conceive, that where a natural proneness to such affections is manifest, as in the Turkish cities, the chances of their occurring in plague will be very much increased. Among the comparatively small number of sick seen by medical men in Márwár, we could not expect to find many cases of carbuncle, even had they been as common as in Egypt; boils and cellular abscesses might have been oftener found on minute inquiry, and probably a few instances of carbuncle or malignant pustule, as they are mentioned by Mr. Cramond and Dr. Keir; the facts, however, already stated, would fully account, in my mind, for their total absence. Little importance being attached to the presence of *petechiæ*, and the attention of the reporters occupied with the more prominent symptoms, they were in all likelihood not often searched for, especially as most of the sick were of a dark copper colour, or even black, and lying generally in places where a lamp was necessary to see any thing with distinctness; in such circumstances, they could hardly have been seen had they existed. At Aleppo, Russell found that a marbled and streaked appearance of the skin was sometimes seen; *vibices*, weals, and *maculæ magnæ* appeared only a few hours before, or immediately after death. As there appear to have been only two or three instances in which the reporters saw the sick immediately before death, or the bodies afterwards, we cannot say that they did not ex-

<sup>a</sup> There are medical men in this country who disbelieve the existence of such a malady, for the same reason that I have heard some deny the occurrence of hydrophobia, viz. because they had never seen it. An English officer with whom I was acquainted, and who had been sojourning for some time at Baghdád, returned to England with one of these boils on his arm, that had tortured him, as they often do, for many months. He consulted one of our most eminent London surgeons, telling him at the same time what he knew of its nature, and received for answer, "O yes, we sometimes hear such stories from travellers, but we know quite well that these date boils are only syphilitic sores!"

ist, as they often do even in common typhoid fever. *Vibices* or *maculæ magnæ* were not observed by Bulard.

It has been said that buboes, and other glandular swellings, so far from being certainly diagnostic in plague, in many and the most fatal cases never appear at all; while they attend, however rarely, malignant fevers, of every type, in temperate climates. It is undoubtedly true, that in the most violent forms of this disease, as well as in the plague of the Levant, the glandular swellings were not developed, and the same is occasionally true of any one of the usual symptoms, which have in turn been found wanting; but when we see both diseases, in their period of decline, losing their virulence by the gradual disappearance of the violent febrile excitement, and of all the train of formidable symptoms which attended them on their first breaking out, and during their increase and height, until the sole characteristic that remains is the tumefaction and suppuration of the lymphatic glands, the conclusion appears to me irresistible, that of all pathognomonic signs this is the most constant and certain, and that its non-appearance is a departure from the ordinary and natural character of the disease, and only happens in the most malignant cases, from some peculiar idiosyncrasy, or from a constitutional tendency to the formation of boils or carbuncles. I do not here include what are called parotids, which are, in my opinion, to be considered in a very different light from affection of the conglobate ganglia, as they never occur either in plague or typhus fever until the disease is far advanced, and are seen chiefly among children. The assertion that buboes attend malignant fevers, of every type, in temperate climates, has been repeatedly made; but the truth of this assertion, as applicable to the fevers of any climate, is quite unsupported by evidence. We are, indeed, told that Cheyne and Baker met with a few cases of swelling of the parotid, in the typhoid fevers of Ireland; and that Rush of Philadelphia, in his extensive experience in yellow fever, found *two* of the same kind, besides *one* of cervical bubo, and *three* inguinal, which were probably owing to some unnoticed abscess, or absorption

of morbid matter, unconnected with the disease. Swelling and suppuration of the parotids only are mentioned by Craigie, as occurring in the remittent fevers of warm climates. Such statements as these, instead of proving the occurrence of buboes in fevers, most decidedly shew the contrary to be the truth; and, amongst a great number of cases of severe typhoid fever, which I have had an opportunity of seeing in the infirmary here, during the past winter, not a single case of swelled lymphatic ganglion has, so far as I know, been noticed, and but one of swelling of the parotid in a young boy; the experience of the physicians of this city, leads, I believe, to the same conclusion, of the absence of buboes in typhus fever; and I am firmly persuaded that in no other disease but plague is their constitutional manifestation ever observed.

An argument that has been brought forward to prove that this disease is not plague, or, rather that it has originated from other sources than plague, is, that buboes, and other signs of plague, have been produced in some who have died from exposure to putrid *effluvia*. The objection made in the preceding paragraph it is here found convenient to forget, and to convert the bubo into a pathognomonic symptom of plague; but, allowing this to pass, when proof is brought that the Kattiwár or Márwár disease presented the same features as the cases alluded to, especially in its third form, where the buboes are the chief symptom, or that the disease can be traced to putrid *effluvia*, the argument will have some weight.

That a fever said to have resembled this disease, and which may be granted to be identical with it, prevailed in Kumáon in 1834—35, proves nothing on one side or the other, though it may afford interesting considerations in some respects.

It is said that inflammation and tumefaction of the glands, which occur in other diseases, do not prove any ailment to be plague; but, as I think it is sufficiently shewn that they do not occur in similar diseases, this objection falls to the ground.



It has been maintained that this disease is the same as the epidemic remittents, prevailing about the same time from Kurnál to Murádábád, and described by Messrs. Spence and Guthrie; differing only in the absence of buboes, and presence of jaundice. It is difficult to conceive on what ground such an opinion could be formed, except on that of their contemporaneous prevalence; as, instead of the only difference between the two diseases being confined to the two symptoms above mentioned, their whole character was dissimilar. Instead of that instantaneous and mortal depression, unpreceded by morbid action or sensation, characteristic of the worst form of pestilence, and which is said by Dr. Ranken, to have occurred at Murádábád and not in Márwár, the invasion of the fever referred to was mild; it generally commenced as an intermittent or pure remittent, followed by jaundice and severe gastric affection in every case, its whole course and peculiarities differing widely from the Márwár disease. In comparing the two, the absence of glandular swellings in the one, and of jaundice in the other, are set aside as symptoms of no importance; by instituting such a comparison of febrile diseases, and striking out a few troublesome generic and specific characters that stand in the way, we may, no doubt, much simplify and shorten the nosological table. In fatality, at least, according to Mr. Guthrie's account, the fever at Barcilly might well claim pre-eminence over every known disease, as "one unfortunate village is said not to have one inhabitant left alive!"

The only remaining objections worthy of particular notice are, "that this is not the plague of Egypt, or of the Mediterranean, imported from abroad, and propagated by specific contagion;" and that the *pestis* of medical authors has hitherto been unknown in India. Great weight has always been laid on the want of proof of importation, in settling the dispute regarding its nature, and it has been already admitted that such proof is wanting; when we daily see, however, that what are supposed to be the strongest proofs by one party, are rejected as worthless by the other, the dispute, un-

der any circumstances, would still remain unsettled. It has already been shewn, that there are strong reasons for believing it propagable by contagion, but this property has been denied by many to the plague. If the existence of a disease, in any country, be denied, unless there is established proof of its former residence in it, the *cholera spasmodica*, and the most common *exanthemata*, ought still to be excluded from the catalogue of British maladies. Besides, it has been already shewn, or at least rendered highly probable, that this is no new disease in the N. W. of India, but that it has prevailed at intervals from a very distant period. If a traveller, in an unexplored country, should find a plant or animal, agreeing in all generic and specific characters with one already well known to him, possessing the same properties, and existing in a similar *habitat*, would he not at once conclude that they were the same, instead of denying it, on the ground that he could not discover how it got there? It appears to me, that the question now under consideration may be put precisely in the same terms. If a disease, presenting all the characters of Levantine plague, not only in its symptoms, progress, and general issue, but even in its irregularities, is found prevailing in a country closely resembling Lower Egypt, Syria, and Mesopotamia in its physical features, and among a race of people of generally similar habits to the population of those countries, can we avoid forming the conclusion, that both diseases are the same, or at least such close varieties of each other, as not to differ more than the plague of Cairo from that of Aleppo or Baghdád, or the plague of the same place in different years? Some other objections, such as, that plague attacks all places indiscriminately in the district within which it prevails, that it is not essentially different from typhus fever, and that the name of plague has been given to other and widely different diseases, are either altogether incorrect, or prove nothing in the point in question.

The identity of the disease with plague has been insisted on by all the reporters, with the only equivocal exceptions of

Messrs. D. Russell and Gilder, who saw it at a time when its virulence had abated, and who offer no satisfactory reasons for their dissent from the general belief. Mr. Whyte is decidedly of opinion that it is plague ; so are Messrs. M'Adam, M'Lean, White, Cramond, Keir, and T. Russell. Dr. Irvine, on seeing it, was convinced that it was plague, contrary to his pre-conceived and expressed opinion.

The prevalent belief that plague cannot exist within the tropics, is probably to a certain degree true ; but is not to be taken with absolute strictness, as the climate of places in the same latitude differs according to their relative position, and their insular or continental situation ; but even if we apply this test to the disease in question, it will only further confirm the opinion already given ; as we find the southern limit of the tract in which it has at different times prevailed, under the 23d degree of N. latitude ; consequently its extension was from the tropic northward to the 27th degree. In mean temperature, quantity of rain, level nature of the country, and quality of the soil, Márwár bears a close resemblance to Lower Egypt and Mesopotamia ; and the known fact, that the inhabitants of countries possessing similar physical features, in widely distant parts of the globe, exhibit a corresponding resemblance in their manners and mode of life, would lead us, *a priori*, to expect that the diseases with which they are affected would be closely allied ; a subject which has hitherto been but little investigated on a sufficiently great and systematic scale, but which would, if properly inquired into, furnish very interesting results.

One reason of the great opposition made in India to the application of the name Plague to the disease treated of, is to be traced to the apprehensions which the mercantile community, and all who are directly or indirectly concerned in trade, entertained of the imposition of ruinous restrictions on commerce. That such apprehensions are just, the oppressive quarantine laws now existing in most European, and many Asiatic states, too clearly prove ; but it is to be hoped that



more enlightened views will arise on this point, and that these laws, at present arbitrary and unequal in their operation, may be so far modified as to be sufficiently protective, without occasioning, as they now do, an amount of loss, vexation, and misery, which is certainly very great.

## APPENDIX.





# APPENDIX, No. I.

*Summary of the Meteorological Register at Bâlmir for 1837.*

	TEMPERATURE.										EVAPORATION.				RAIN.		PREVAILING WINDS.		Clear days.	Rainy or cloudy days.		
	Maximum.	Minimum.	Average daily maximum.	Average daily minimum.	Mean tempera- ture.	Highest daily range.	Lowest daily range.	Mean-daily range.	Sun at noon.			Maximum daily evaporation.	Minimum daily evaporation.	Mean daily evaporation.	Total.	Inches.	Cents.	Day.			Night.	
									Maximum.	Minimum.	Mean.											
																						In.
January.....	80	49	73	53	66	27	11	20	123	94	108	Cent.	C.	C.	...	...	..	N.W.	N.W.	25	6	
February.....	85	46	74	57	67	26	9	18	129	68	103	36	7	...	...	.15	N.W.	Northly	4	24		
March.....	97	55	84	66	77	25	14	18	134	85	111	39	20	5	.84	...	...	W.	W.	6	25	
April .....	104	68	95	75	85	29	12	19	135	99	122	34	19	8	.20	...	.02	W.	W.	10	20	
May .....	112	72	104	83	94	29	13	21	142	120	130	34	24	7	.52	...	.10	W.	W.	8	23	
June.....	107	75	102	82	92	26	14	20	137	111	123	24	14	6	.03	...	.98	S.W.	S.W.	7	23	
July .....	103	75	96	81	90	20	7	16	125	93	114	21	4	4	.60	...	.75	S.S.W.	S.	7	24	
August.....	98	75	93	78	86	19	4	15	129	97	114	19	7	3	.89	...	.39	S.S.W.	W.S.W.	7	24	
September .....	98	74	93	78	83	22	7	16	138	93	117	16	5	3	.51	...	.42	S.S.W.	W.S.W.	15	15	
October .....	103	70	96	75	89	25	12	18	143	95	129	22	10	4	.68	...	...	W.S.W.	S.W.	28	3	
November .....	93	60	86	67	78	25	6	19	132	91	121	16	7	3	.75	...	.12	N.N.E.	Northly	22	8	
December .....	86	50	79	58	71	27	5	21	126	102	111	14	4	2	.28	...	...	N.N.W.	N.W.	21	10	
For the whole year,	112	46	90	71	81	29	4	18	143	68	117	39	4	14	50	8	.93			160	205	

## APPENDIX, No. II.

*List of the Places affected in the Years 1836—38.*

MÁRWAR.	Jadan,	Roit,	Barlí,	Jât,	Punáhen,
A'wá,	Jaitháran, <sup>1</sup>	Sadres,	Behgú,	Kankrólí,	Raipur,
Anderá,	Jalôr,	Sándero,	Bhílwara,	Kothariya,	Rájnagar,
Bállu,	Jôdhpur,	Selávash,	Bráhmánpíplí,	Kúra	Rámghur,
Báwí,	Káhesta,	Sújet,	Búdhwár,	Lakhmínavaash	Rínchôr,
Buchojî,	Kákni,	Sumárí,	Chánigúríya,	Lakôla,	Rupáhelí,
Búli,	Khairwa,	Taiwáli,	Cheburra,	Lámba,	Sakráni,
Chándolí,	Khemandí, <sup>2</sup>	Tándla,	Dábrí,	Láwa,	Sangánêr,
Chánôd,	Kôt,	Thákuriya,	Daulethgur,	Lulúa,	Sangra,
Chanpávat,	Mándera,	Veshálpur.	Dahwála,	Lusáni,	Satána,
Dehsurí,	Mehpura,		Dhána,	Mandal,	Sehwána,
Denda,	Mogri,	MEYWAR.	Deoghur,	Mangrúp,	Sháhpara,
Deolí,	Nímaj, <sup>1</sup>	Akarsádu,	Gajindra,	Môhi,	Sháhpara Asen,
Dôvash,	Páli,	Amlí,	Gangápur,	Náthdwára,	Thána.
Gandash,	Páwa,	Amrít,	Hamirghur,	Nimbhera,	
Garra,	Pípar,	Bairát,	Húríra,	Páncchel,	MHAIRWARA.
Ghamnúra,	Raipur,	Banera,	Jália,	Potela,	Dewair.
Harjî,					

REMARKS

ON

PLAGUE AND QUARANTINE LAWS.





## REMARKS, &c.

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SINCE the adoption of what are called Quarantine Laws, they have furnished a never-failing subject of contention, both as regards the principles on which they are based, and the manner of their application. It was, indeed, to be expected that laws, affecting the liberties and interests of multitudes, should be vehemently opposed, by a great proportion of those who might suffer from their operation, either in person or purse, as it would be a hopeless task for human ingenuity to frame any regulation for the public good, which did not require, to a certain extent, the sacrifice of private interest or inclination. It is much to be regretted, that in discussing such questions, the contending parties, as in politics, are generally so hostile to each other, that nothing less will satisfy them than the rejection *in toto* of the proposals or reasoning of their opponents, from the commonly received, but very fallacious dogma, that no intermediate course can be either safe or practicable. It is no doubt true, that where the facts on which a particular law rests, admit of direct proof, or are self-evident, half-measures would be worse than useless; and there would be little difficulty in satisfying all well-informed men of the necessity of the precautions employed, or of the expediency of rendering them permanent, and fully efficient; but if it can be shewn, that much of what is taken as fact in regard to the phenomena of plague, is very doubtful, and that the conditions under which that disease is found to prevail, are continually varying, it is certainly not too much to expect, that the utmost care and moderation be used in their applica-

tion, so as to prevent the infliction of any unnecessary loss, vexation, or injustice.

Several attempts have been made of late years, to attract the attention of European governments, to the defects and abuses of the Quarantine laws, but apparently with little success. The advocates of an improved system, or rather of the total abolition of the present one, not content with exposing its many inconsistencies, have generally denied, contrary to the strongest evidence, the truth of the long established belief in the communicability of pestilential disease, directly from the sick to the healthy ; and by going far beyond what they are warranted in asserting, have weakened their whole case. As those who have lately exerted themselves in exposing the defects of our sanitary laws, have either been more or less connected with the mercantile community, or have personally experienced the hardship and injustice of their operation, their statements have been received with distrust, as altogether prompted by interested motives, or flowing from irritated feelings. Still, making due allowance for this, their objections and complaints, when reasonable, ought to be listened to and redressed ; more especially, as only an imperfect idea of the magnitude of such abuses can be felt by those who have not experienced them, and but few evils of the kind are remedied, until they have been thus personally felt and resisted ; while, so long as a very small portion of the public only is directly affected by the quarantine laws, the subject does not excite that general and earnest attention which is necessary for the settlement of a question of such importance. In proceeding to take a short view of the present state of these laws, with regard to the prevention and check of plague, it will be necessary to notice, in succession, the most striking phenomena presented by that formidable disease, and to consider how much of what is recorded under this head, we are warranted in considering as fact, and how much of it is only assumed to be so.

The origin of plague, like that of small-pox, measles, syphilis, and many other diseases, is lost in obscurity. Unless we



hold with Ambroise Paré, that such maladies are miraculously produced, as special inflictions of the Almighty, we must look upon all of them as having sprung from some combination of natural causes, which, however rare, may again recur. There seems to be little doubt, that plague, as it now appears, was unknown to the ancient physicians; and the few allusions made to it by the Arabian writers of the middle ages, are neither circumstantial nor satisfactory. We do not even know where it was first observed, as many destructive epidemics, resulting from starvation and fatigue, or diseases altogether different from the plague of the present day, were designated, from a very remote period, by the term now exclusively appropriated to that malady. The mortality, during the first siege of Rome by the Goths, under the reign of Honorius, A.D. 408, and again under the same circumstances in 537, appears to have been occasioned by ordinary typhoid fever, produced by famine, and the other causes usually existing among the crowded population of a besieged city. The *pestis* of modern nosologists seems to have manifested itself, for the first time, in the reign of Justinian, A.D. 542, in the Delta of the Nile, near the sea coast, and, according to somewhat doubtful authority, in the immediate neighbourhood of Pelusium or Tineh.<sup>a</sup> It soon spread through Syria and Asia Minor,<sup>b</sup> and since that period it has extended its ravages over the north of Africa, the central and southern portion of Europe, and the southwestern parts of Asia; from the longitude of Mogador to that of Ajmir, and from the Tropic of Cancer to the latitude of Moscow. Having been traced by common consent to Egypt, the inhabitants of that country, in their turn, referred its nativity to Æthiopia, the land of mystery and wonder, and the

<sup>a</sup> Gibbon, Decline and Fall of Roman Empire, Chap. XLIII.

<sup>b</sup> Perhaps one of the earliest notices on this point, by the Arab writers, is that of the death, by plague, of the 13th Khalif of the race of Ommiyàh, Yezid ben Welid, at Damascus, in the year of the Hejrah 126, or A.D. 743. That the pestilence, which raged during the reign of Justinian, was plague, is proved by the name, *Lues inguinaria*, given to it by the monkish writers of the time.

assigned birth place of prodigies, and this groundless belief has, in modern times, been professed by Dr. Mead, who perpetuated the error by his authority. This supposition, adopted even by the learned and accurate Pauw,<sup>a</sup> is purely imaginary, and, although it is by no means true, as is generally asserted, that the plague never prevails in Nubia, or passes beyond Esuan, the ancient Syene, and frontier town of Egypt to the south,<sup>b</sup> yet it has been seen there so rarely, and has passed to so short a distance upwards, as to confirm the truth of Burckhardt's remark, that it never prevails in Nubia above the second cataract, at Wádí Halfeh, and that it is unknown in Donkala and Senaar.<sup>c</sup> We have not only the remarkable fact of the immunity of Æthiopia from the disease, but we also find that the causes assigned by Mead and others for its production there, such as extreme heat, moisture, stagnation of the air, putrefaction of animal and vegetable matter, and of heaps of dead locusts, if we except the first, exist only in their imagination, or are found in a less degree than in any other part of the globe.

While one party maintains that plague is always indigenous in the countries which suffer from it at the present day; that it is not specifically different from other typhoid fevers, and that it is the necessary product of the influences exerted by climate, and certain states of society on each other; their opponents assert as positively, that it always originates from cases of the same disease previously existing, being reproduced and multiplied from itself, by the means called contagion, either mediate or direct; or by infection or impregnation of the atmosphere with effluvia from the bodies of pestiferous patients; that it is specifically different in its nature from all

<sup>a</sup> Œuvres Philosophiques, Recherches sur les Egyptiens, Tom. IV. p. 113.

<sup>b</sup> According to the Arab historian Makrizi, 21,000 died of plague at Esuan, in the year of the Hejrah 806, A.D. 1403; but the number is certainly much exaggerated.

<sup>c</sup> Travels in Nubia, p. 144.

other diseases; and, that however favourable to its introduction or spread, the climate or circumstances of any country may be, they are not alone sufficient for its production. In considering the causes of disease in general, and particularly of epidemics, it must never be forgotten, that the condition of the different nations of the world is perpetually varying, not only with regard to manners and habits, but also in respect of climate, and the local changes induced by civilization or barbarism, the encouragement or neglect of agriculture. Notwithstanding all the attention which has been bestowed on this subject, we are unable to point out, with any degree of certainty, the conditions essentially necessary for the production of pestilential disease, although we can enumerate those which most commonly attend its appearance. No one is justified, for argument's sake, in substituting conjecture for fact; yet, in the absence of sufficiently trust-worthy evidence, and considering the absolute impossibility of obtaining satisfactory proof of the immediate origin of plague in any place, from the mass of obscure, incorrect, and often contradictory assertions generally brought forward; we are reduced to the necessity of endeavouring, by comparison and analogy, to fix upon what is most probable and most consonant with reason and experience.

In examining the physical state of such countries as have, at various periods, been the seats of the plague, we find that a remarkable relation exists between the frequency of its appearance and extent of its ravages, in any one of them, and the prevalence of intermittent and remittent fevers. It is well known that in London, and many parts of England, before the end of the seventeenth century,<sup>a</sup> when plague was common, intermittents were very prevalent and fatal; since which time they have entirely disappeared from most of the localities formerly infested by them. In many of the large cities of the East, where plague

<sup>a</sup> Judging from the bills of mortality, plague was not wholly extinct in London till the year 1680; and it would appear that, from 1603 till 1679 inclusive, only four or five years were altogether free from it.



is still a frequent visitor, both intermittent and remittent fevers prevail to such a degree as, in certain seasons, almost to equal it in mortality. From such considerations, many have been led to infer the common origin of all febrile miasms, or, to hold with Dr. Johnstone, that the endemic fevers of different countries, are produced by the superadded influence of marsh miasm, upon fevers occasioned by, or sympathetic of, local congestions arising from vicissitudes of temperature. This, or the converse of it, may or may not be true of the ordinary endemics of a country, as it is only a part of the common theory of the origin of all such fevers, expressed in different words. That certain causes concur in the generation of many fevers is highly probable, as there is also reason to believe that the same constitution of the air favours the growth and spread of various other diseases. While, however, the ordinary endemics of warm climates often manifest themselves in open and isolated situations, the first appearance of plague, or typhus, has always been observed in the midst of a dense population; and this fact suggests an important difference in the nature of their origin, leading to the belief, that vitiated animal effluvia, from living bodies,<sup>a</sup> are essentially necessary for the production of plague. Great stress has always been laid on the influence of low and moist situations, scanty or unwholesome food, poverty and filth, in giving rise to typhoid fevers; but it has always appeared to me, that such influence has been very much over-rated, and that a circumstance of much greater importance, and more powerful operation, has been nearly unnoticed; viz. the crowding together, in a small space, of numbers of human beings, whether

<sup>a</sup> It is a well established fact, that, under ordinary circumstances, the effluvia arising from putrid animal matter, even when existing in great intensity, are not productive of disease. In the Greek cemetery at Smyrna, in 1837, about 200 bodies were interred; the stench arising from them was such, that the persons inhabiting the vicinity could scarcely endure it, and were obliged to shut their doors and windows, and burn perfumes to overpower it. Their health, however, was not injured, nor did the plague commit greater ravages among them than elsewhere.

in a state of health or disease. There is reason to believe, that of all the apparent causes of plague and typhus, this is the most constant and essential; indeed we have convincing proof, from many remarkable facts on record, that it is of itself sufficient for the production of the most destructive typhoid fevers. From the extreme poverty existing in most of the large cities of Scotland and Ireland, where the ravages of typhus are so great, it has too hastily been assumed that want is its immediate, and almost sole cause.<sup>a</sup> That it is indirectly a cause, may, indeed, be allowed, (in these towns at least,) in so far as the congregation of multitudes of people, in confined habitations, is one of the most usual consequences of poverty; but mere famine or want alone have never generated either plague or typhus.<sup>b</sup>

That certain conditions of the atmosphere, as to temperature, humidity, electrical state, and the like, are necessary adjuvants, is allowed by all; but these conditions probably

<sup>a</sup> This is well illustrated by the progress of typhus fever in Glasgow, where destitution had, at various times, existed to a great extent before that disease was known, or had appeared in the reports of the Infirmary; but soon after its first breaking out at Campsie, about twelve miles north of Glasgow, it shewed itself in the city. Professor Graham, then one of the physicians to the Infirmary there, up to the time of his quitting Glasgow, never could trace any relation between the degree of prevalence of fever, and the fluctuating condition of the labouring population, as to high or low wages, abundance or want of employment. See Graham on Common Fever, *passim*. I am happy to find my ideas, on this point, confirmed by the observations of Dr. Galen of Aberdeen, who, in some tables of great interest, which he has drawn up on the statistics of the exanthemata and typhoid fevers in that city, has found the prevalence of these diseases to be in a direct ratio with the crowded state of the houses alone, and that, where this essential condition is absent, neither the most abject poverty, nor the most disgusting filth, nor the lowest and most noisome situations, appear in any degree to favour their existence or spread.

<sup>b</sup> By tables of observations, continued for a series of years, it was found that plague had broken out and raged extensively, without being preceded by any famine, and without following any strictly periodical course. Pauw, *Recherches sur les Egyptiens*, Tom. IV. p. 113.

operate within very wide limits, especially that of temperature, the variations of which appear to be of much less importance in influencing the spread, not only of plague and typhoid fevers, but also of the exanthemata, than changes in the degree of humidity or dryness of the air. What has been called the pestilential constitution of the air, a peculiar occult state of that element, supposed to be necessary for the existence, or favourable to the ravages of plague and malignant fevers, has been ridiculed by some, and supported by many; and although, under ordinary circumstances, we are neither obliged nor authorized to have recourse to such an assumption, it must be confessed, that without it, we find it impossible to explain, even theoretically, the phenomena of epidemics. Yet plague has been seen at all seasons of the year, both in warm and temperate climates, and although it is often confidently asserted, that it appears in Lower Egypt about November, and ceases entirely after the middle of June, we have strong testimony to the fact, that it is never absolutely extinct in Cairo or Alexandria.<sup>a</sup>

The means by which the extension of plague is accomplished, or influenced, have been classed under three heads. 1. Direct communication of the disease, from any one labouring under it to another person, or animal, by actual contact of their bodies. 2. Mediate communication, by inanimate substances impregnated with the morbid principle, and known by the name of *fomites*. 3. Mediate communication, by confined air impregnated with the morbid principle, and commonly called infection, or atmospheric contagion. The consideration of these points has perhaps occasioned more controversy both with regard to plague, typhus, and some of the *exanthemata*, than any other subject of medical inquiry. The difficulties of the investigation are certainly very great, and indeed, in the present state of our knowledge, almost insurmountable; all the sources of science having as yet proved insufficient to

<sup>a</sup> Holroyd on the Quarantine Laws. Bowring on Oriental Plague and Quarantines. Aubert, *De la Peste*, 1840, p. 23.



detect, either in the human body, or *in transitu*, the morbid principle even of such maladies as are generally allowed to be communicable from one individual to another, or to show in what it consists. In all discussions on the above points, it has been a favourite practice of the contending parties, but more particularly of the opponents of the doctrine of contagion, to tax each other with the accusation of credulity and interested motives; and in many instances, the assertions of medical charlatans, and disappointed adventurers, or the results of their jealousies and abuse of one another, are seized upon without scruple, as trust-worthy evidence on this all important question, as they happen to suit the inclinations or theories of the writers.

Among the arguments urged in favour of the extra-corporal causes of plague, and against the doctrine of its propagation by personal intercourse, one of the most prominent is; that in no instance can its introduction be traced from one country to another. On a question of this nature, it has commonly been allowed, that a single positive and well authenticated fact ought to out-weigh any amount of negative evidence; but such does not appear to be the opinion of the advocates of non-transmission. In considering the phenomena of the spread of small-pox, scarlet fever, or typhus, we find innumerable facts, which confirm the prevalent belief in their extension by association or personal intercourse, in such a manner that it cannot be shaken by the mass of imperfect and contradictory assertions that might be brought against it, as has been done in the instance of plague. Let any one consider the obstacles to a satisfactory inquiry regarding the introduction of plague into any country, especially if in that country sanatory laws should happen to be cruelly and despotically enforced; can he expect that the fear of punishment or infamy will have no effect in suppressing or falsifying the truth? Would it not be in the highest degree absurd to suppose, that any force whatever could entirely suppress smuggling, so long as the love of gain or gratification exists in the human mind; or that those interested in its concealment

would voluntarily expose their guilt? Besides, when the repugnance of every people, but especially of Eastern nations, to domiciliary visits, or interference by public authorities in family matters, is recollected, it will be found, that evidence in support of the communication of plague by contact, or association, can only for the most part be obtained against the will of those who furnish it. In Alexandria, the only city where any thing like accurate information regarding the extension of plague has of late been collected, the attention of all parties has been directed solely to the means of ascertaining whether it had, or had not, been imported from abroad, on every occasion of its extensive prevalence; while they seem to have entirely forgotten that it is never extinct, either in that city or in Cairo, and that it was needless to suppose its annual importation, while it already existed.<sup>a</sup> There has hitherto scarcely been an instance, where the first manifestations of plague have been accurately observed, or, where the nature of the disease has not been mistaken, until its ravages had become serious; by which time, owing to numerous causes, the chances against arriving at accurate conclusions by any inquiry, however carefully conducted, must be obvious to every one. Even allowing the occasional indigenous origin of plague in Egypt, it is certain that it has been imported on several occasions into Alexandria; and that it has been introduced into many European and Asiatic ports, we have the most complete proof that the thing will admit of, recorded by almost every author who has written on the subject. If it has been repeatedly seen to break out in Lazzarettos,<sup>b</sup> either

<sup>a</sup> The following is the evidence of Dr. Gregson, from Mr. Holroyd's pamphlet on the Quarantine Laws, p. 15.

Q. 14. Do you believe that Egypt is ever entirely free from plague?

A. I believe Egypt *never* free from plague.

Q. 15. How do you believe that the disease is propagated?

A. I believe it originates from miasmatic influence, from finding its ravages *ceasing* about the 20th of June, there being no longer humidity to favour the decomposition of animal or vegetable substances.

<sup>b</sup> At Beirút, in 1838, plague first appeared about the beginning of May in the Lazzaretto, among some Greeks from Cyprus.—Holroyd, p. 6.—

among the crews of vessels from infected places, or among those who had intercourse with such crews; and where no other physical agents can be discovered than those which are in operation, not only in the neighbourhood of these sea-ports but throughout the country, what other rational conclusion can we arrive at, but that it was imported? In Egypt, in 1801, it appeared first at Rosetta, the only port open for Greek or Turkish vessels. It is not easy to conceive the bounds of human credulity, with which failing the supporters of the doctrine of its importation are so often taxed; obdurate scepticism, however, is only credulity carried to the opposite extreme, and is far more mischievous in its effects. When plague was brought to Messina in 1743, by a vessel from the Morea, the first cases occurred among the crew in the *Lazzaretto*. After several hundred deaths, thirty-three physicians formally denied that it was plague, and, as human nature is always the same, such dreadful scenes of carelessness and disbelief, followed by universal panic and destruction, may again and again recur.<sup>a</sup>

In the spring of 1837 it also broke out in the *Lazzaret*. See Remark by Count de Bertou, p. 88, note.

<sup>a</sup> It frequently happened that where a case of plague was reported in Alexandria, and supposed to be solitary, closer inquiry shewed that it had not only existed in the same locality for a considerable time previously, but that many deaths had been caused by it. See Aubert, *De la Peste*, pp. 31, 33, 35, 36. A more striking example can scarcely be cited of the carelessness, ignorance, or knavery of the Levantine Franks, than that given by Dr. Walsh, in his book on Constantinople, V. ii. p. 155. "The catholic clergyman of Buyukdereh had just returned from that place to the convent of St. Antonio, to which he belonged. He complained of illness, and in thirty-six hours was dead. As the circumstances of his death were alarming, the plague doctors were sent for; but, on due examination, no mark was found to indicate pestilence. The body was then laid out in the chapel, with his naked hand extended, and, as he was a man of celebrated sanctity, thousands came to kiss it. One of the persons, while performing this ceremony, thought he perceived something suspicious on his arm; so it was rumoured about, and it was thought necessary to examine the body a second time; and then buboes and carbuncles were actually discovered." How many such cases have been con-



Were it even allowed that the importation of plague had never been proved, it by no means follows, that the disease once formed, is incapable of being propagated from one individual to another. It is frequently urged, that many cases of it occur, which cannot be traced to intercourse with persons previously affected; but that such untraceable cases ever happen among the better classes, or among well-informed people, who can give a proper account of themselves, and who know with whom they have associated, when no concealment is practised, I am much inclined to disbelieve. Many instances are daily seen in this country, where patients suffering under typhus fever, deny, as well as their friends, all such intercourse, but where the fact of its having taken place is established by careful inquiry. In truth, such testimony is to be valued solely by the character of the relaters for care, accuracy, and freedom from prejudice, and can seldom be received as absolutely certain. The appearance of plague in the Lazzaretto of Genoa, in 1667, and in the Hôtel Dieu of Marseille, in 1720, are only two well known and authentic instances, out of many similar ones, where it immediately followed the admission into these places of individuals labouring under it. An argument constantly adduced against the communicability of plague is, that the attendants on the sick, or those having intercourse with them, are not attacked in greater proportion than others not so circumstanced. This assertion is so frequently made, that one is naturally surprised to find it so devoid of truth as it is. That in airy and commodious dwellings, or in open and well-ventilated hospitals, the majority of the attendants occasionally escape, is true, not only of plague, but of typhus and the *exanthemata*; but the reverse

cealed through interest or fear? Again, in a state of alarm, the same carelessness or ignorance, cause other diseases to be mistaken for plague. See Bowring on Oriental Plague, p. 14, note. In the circumstance related by Dr. Walsh, of the entrance of the crew of an infected vessel into a crowded chapel, there is no proof, or even probability, that the disease existed on board, further than that they had a foul bill of health from Egypt.

of this is commonly seen, as is shewn by numerous instances, of which the death of all the attendants in the first hospital for plague patients opened at Marseille in 1720, and the experience of the medical officers with the British army in Egypt, as related by the present Director-General, Sir J. M'Grigor, are sufficient examples. Owing to prompt isolation of the sick, the disease prevailed to a very trifling extent only among the men, but the number of guards and attendants at the pest hospitals who were attacked was very great, and, out of thirteen medical officers directly exposed to it, no less than seven were seized with it, of whom four died. Such instances as these, occurring in perfectly organized regimental hospitals, are of more value than thousands reported in cities like Cairo or Alexandria, in their present state.<sup>a</sup>

<sup>a</sup> The greater part of the information regarding plague in the East, can only claim the value of probability; and the rates of mortality given are but doubtful approximations to the truth. Although the Council of Health at Alexandria have done all that they could do, under the circumstances in which they were placed, yet it really appears, that it was only in cases where concealment was difficult, or information accidental, that they knew of its existence. It was discovered, for instance, in the quarter of the negroes at Alexandria, on the 15th August 1834, but only after sixteen persons had died of it, and many others were affected.

With all respect for the abilities and exertions of Dr. Bowring, it must be confessed, that after premising that he speaks as a statistical rather than a medical observer, and stating that "all statistical materials are, in the Levant, of a very uncertain and unsatisfactory character, and especially the statistics of disease," one would hardly expect to meet with many such passages as the following: "Wherever I had occasion to witness the introduction or progress of the disease—its introduction was spontaneous,—indigenous,—endemic,—its progress never traceable from patient to patient; it broke out in districts remote from one another, between which there had been no communication, and while my own observation surrounded me on the one hand with thousands and tens of thousands of cases, in which the most intimate intercourse with persons ill or dead of the plague—the dwelling in their houses—the wearing their garments—the sleeping in their beds, were not followed by disease in any shape; I was called on the other, to listen to stories, as evidence of the contagiousness of plague, so puerile, so ridiculous, that nothing but oriental credulity could by possibility be satisfied by them." The credulity and igno-

The communicability of typhus, which has been also denied, is supported by evidence of the most convincing kind, known to every practitioner ; and although in airy hospitals, the risk incurred by the physicians and attendants is much diminished, the records of the Edinburgh or Glasgow fever wards shew, that of those having much intercourse with the sick, very few escape, notwithstanding every precaution, and exhibit a long list of nurses, clerks, and physicians, who have fallen victims to the disease. With regard to the value of a series of cases of plague, or any malady presenting similar phenomena, in proving whether it is communicable or not, it is only when taken comparatively that their full weight is perceived ; that is, they must not be considered separately, but in connection with what has been observed for a number of years. Many instances have been noticed, where intercourse with plague patients has not occasioned the disease in others, but if we look to the phenomena of scarlet fever, measles, or even small-pox, we shall find that these exhibit many parallel facts, not only in this respect, but in many others. In an open, dry, and moderately cool air, these maladies seem to be, in a great measure, divested of their virulence and capability of extension ; while the hot and arid winds of Asia, and the African *harmatan*, check the most destructive ravages of small-pox for a time ; but, even in seasons favourable to their prevalence, how small a portion of the community suffers from these diseases, so eminently communicable, and how many escape them altogether ? I have seen an isolated case of small-pox occur in a crowded vessel in the Red Sea, twelve days after leaving Bombay, and run its course without affecting another individual on board. How was it, then, in the close and confined hold of a ship, and amidst numbers who

rance existing among all classes in the Levant are no doubt great, and much to be lamented ; but were Dr. Bowring's opportunities such as to enable him to investigate every individual case of tens of thousands, or to speak with the confidence of an old and experienced physician, who had spent his life in the inquiry ?



had never been vaccinated, nor had the disease previously, that it did not spread? Would not this circumstance, if taken singly, disprove the possibility of its propagation by contact or association? If we examine the few examples, so strongly insisted on by M. Aubert, as demonstrating the non-communicability of plague, we find that the spasmodic or isolated cases of M. Werline, Mad. Savignon, and the Greek slave of the Sieur Scaramanga, occurred in October 1836, after the ravages of the disease had nearly ceased, and at the time allowed, even by himself, to be most unfavourable to its existence or spread. It is to be observed also, that these cases happened at a period when the Council of Health of Alexandria was completely disorganized, and the imperfect, but still valuable information usually registered by them, not attainable; and as it is by no means clear who, or in what capacity, his Turkish informants were, we must doubt the truth of their representations, that other cases did not then exist, especially as they had been so numerous only a short time previous. The same is true of the cases of Mesdames Bella and Portalis. The instance occurring on board the brig of war "La Sylphe," in the port of Alexandria, in which a sailor lay ill of plague for three days, without any bad consequences to the other individuals on board, affords facts precisely similar to those of the above mentioned case of small-pox, except that in the French vessel, the patient was for a much shorter time in communication with the crew. In another example cited, the surgeon of the brig "La Surprise," visited the pest hospital in the lazaret, and because, according to M. Aubert, it is the rule of the lazaret to touch nothing, and to remain in the centre of the wards, at a distance from the sick, he insists that the surgeon must have complied with the regulation as a matter of course, although there is no evidence to that effect. The vessel sailed, and scarcely was he at sea before he was taken ill, and died at Rhodes of plague, six days afterwards, without communicating it to any of his companions. In the brig of war, "La Fleche," a Turkish passenger from Candia to Constantinople,

who was obliged to remain on deck, exposed to the weather, covered himself with a thick cloak which he took from among his baggage; next day he sickened, and died of plague, after a short illness. M. Aubert, reasonably enough, ridicules the idea that the disease was here communicated by the cloak, but assigns, with no less absurdity, the inclemency of the weather as its cause; and, without knowing any thing of the previous history of the man, or with whom he had associated, contents himself with saying that, had plague existed at Candia, he would not have been received on board; nor would he, had the officers of the brig known of it, but how could they be expected to do so?<sup>a</sup> It is allowed, even by those who oppose the commonly received opinion, that the health-guardians, and washers and buriers of the dead, were attacked in great numbers during the last Alexandrian plague; and three directors of the lazaret, and several head-guardians, died in succession, besides many of the medical practitioners, French and Italian. With regard to the attacks which took place in the arsenal, the hospital of the marine, the harem of the Pasha, the barracks, and the hospital of Rás el Tín, notwithstanding the alleged strict quarantine which was enforced in them, I have only to remark, that the maintenance of a perfect quarantine among Mohammedans in a crowded city, is in my opinion impracticable. The efficacy, however, of prompt removal and isolation of the sick, is nowhere better shewn, than by the fact, that in the arsenal, where it was carefully practised, only seventeen cases occurred among 6824 souls; while in the barracks, where the same precautions were not adopted, 400 deaths happened out of 3000 men.<sup>b</sup>

<sup>a</sup> De la Peste, p. 67, et seq.

<sup>b</sup> That the immunity of the Egyptian fleet, so much spoken of by Messrs. Abbot, Aubert, &c., notwithstanding the frequent intercourse between it and the shore, did not always continue, is evident from the following sentence:—"During our quarantine, the plague was raging in the arsenal of Alexandria, and in three Egyptian ships of war; and persons ill with plague were daily brought from the latter to a jetty, which pro-

On a general survey of the state of the question, between the supporters of the communicability of plague by personal intercourse or association, and those who maintain that its origin is always independent of, or unconnected with, previously existing cases; it appears to me, that evidence of great weight may be obtained by contrasting its phenomena with those of certain diseases, about the origin or mode of propagation of which most persons are agreed. It is allowed, that under peculiar circumstances, the ordinary endemics of warm climates may acquire the power of propagating themselves to individuals situated without the limits of their usual *habitat*; and there is every reason to believe that this quality is generated by the influence of vitiated animal effluvia, from living bodies, superadded to the agencies, whether terrestrial or atmospheric, which originally produced them. We have very little information as to the results of the mutual action of corporeal and extra-corporeal miasms, but it is at least highly probable that all diseases communicable by means of a specific *virus*, are the products of such action, modified by peculiarity of constitution; and that, without the concurrence of these conditions, they could not have arisen; the conditions, however, although capable of being classed under general heads, admitting of an infinite variety of changes, and consequently generating endless shades of disease. There is no difficulty, therefore, in conceiving, nor reason to prevent our supposing, that plague and other maladies, although usually propagated by association, from previously existing cases, may originate *de novo*, or, in other words, be indigenous and endemic in certain countries. We often hear of plague assuming the character of malignant typhus, because it has been preceded, accompanied, or followed by it; shewing that

jected into the sea from the office of health. Here they remained, sometimes for two or three hours, awaiting the arrival of the physician.  
 . . . . . Almost every case proved fatal, in consequence of the extreme neglect and gross inattention shewn by the attendants to the sufferers." This was in the end of June 1838.—*Holroyd on the Quar. Laws*, p. 10.



there was a tendency to the production or increase of diseases of the same general character ; or of its changing into common, remittent, or other fevers ; but, in these instances, the usual agents have merely recovered their preponderance in producing disease, no such permutation really taking place. If the state of the air, and other concurrent circumstances which favour the existence of plague, be the same which promote the ordinary endemics or epidemics, it is probable that its recurrence in any particular season, in countries where it rarely prevails, is owing to some accidental or extraneous cause, as in other years, during the interval, the usual diseases only are observed. It has been urged against the doctrine of the communicability of plague, that it does not rage with equal intensity at different places, while intermediate or neighbouring districts often escape altogether ; but surely the objection operates with much more force against the theory of its atmospheric or terrestrial origin, while the very same phenomena are observed in scarlet fever, measles, and small pox. By supposing otherwise, we should deny that plague is affected by the causes which operate on diseases which are allied to it. How shall we explain the remarkable facts, frequently observed in the progress of plague over extensive countries, its steady advance for years, under every variety of season and climate, by referring its extension solely to atmospheric agencies ? The air undergoes a constant and rapid circulation, both chemical and mechanical, and we would naturally expect that any pestiferous miasm diffused in such a mobile fluid, would pervade it with great rapidity, and produce almost simultaneously its deleterious effects over whole kingdoms ; how then does it leave thousands or even millions untouched ? The rapid decline of plague, however, when its sources have been multiplied to a very great degree, is not explicable without assuming the operation of some influence, with the exact nature of which we are unacquainted ; and it is doubtful how far the predisposition to plague, and its occasional rapid extension, may be identified with, or included in, the existence of a certain state of the air, not essentially ne-

cessary for its production, but favourable to its spread. Under any circumstances, it is no more wonderful that the miasm of plague, like that of other diseases, should not act on every individual exposed to it, than that the same infection should produce in different instances, a disorder slight or severe, mild or mortal. To those therefore who assert, that if the plague were communicable, the inhabitants of Egypt or Turkey would be exterminated, it is sufficient to say, that all are not susceptible of it, even under favourable circumstances ; that the conditions necessary for its transmission do not always exist, and that the same might be maintained of other diseases, in which experience has shewn that it is false. Many, however, who ridicule the communicability of plague, seem to forget that no sensible person would support the theory of inevitable transmission.

The great difficulty in forming a correct idea as to the probability of the communication of plague by direct contact, by *fomites*, through the medium of the air, or by all of these means, consists in the entangled nature of the evidence, and in the impossibility of separating what bears on one point from what relates to the rest. If an individual who has been in contact with a pestiferous patient, and who has, at the same time, respired an atmosphere impregnated with effluvia from his body, or which may have been otherwise vitiated, be afterwards seized with the disease, shall we attribute the attack to the personal contact, or to the deleterious atmosphere ? Reasoning from the current doctrines among physiologists, regarding the comparative absorbing power of the skin and air passages, association would certainly appear more likely to effect the transmission of the disease than contact ; and this appears to be confirmed by observation. In an affection like itch, depending on the presence of a peculiar insect, it is evident that contact alone operates ; but it is very questionable, whether even small-pox could be communicated by ordinary and temporary contact with sound skin, and whether it would not require long continued and most intimate contact, or the existence of an abraded or strongly

absorbing surface, such as is necessary for the introduction of the syphilitic poison. Seeing the extent of surface, and exquisite sensibility of the air passages, we need not be surprised at the rapidity and certainty with which many substances, in the form of gas or vapour, can be introduced into the body, or made to exert a specific influence on the nervous system; and it is extraordinary that a channel, so well adapted for the communication of disease, and which is open under all circumstances, should be thought of so little importance, or even entirely disregarded by many, in considering the causes of its extension. Most of the opponents of the communicability of plague seem to think, that by shewing the absurdity of the belief in its inevitable or even probable transmission by bodily contact alone, or by means of *fomites*, they have proved that it never can be communicated by personal intercourse; and that the only conclusion remaining to be drawn is, that it depends altogether on local or extra-corporeal causes.<sup>a</sup> Instances must be known to almost every medical practitioner in Great Britain, where typhus fever, and other diseases, have attacked individuals after a short stay in the apartments of the sick, when no contact had taken place. Indeed, there are well known cases of persons so susceptible of the impression of febrile miasm, that entrance into a fever ward is sure to be followed by a severe attack of the disease; and this has happened so frequently to an eminent Edinburgh professor, that his colleagues have been obliged to insist on his

<sup>a</sup> The following instance is adduced by Dr. Gregson, to shew that plague is not communicable, but it clearly proves that it is so by association. Although the attacks appear to have taken place in succession, yet he says that all the men were infected at the same time, on what grounds I cannot discover. "Amongst others, a servant belonging to our hospital was attacked; he was a black. We were shut up in quarantine, one thousand in number. Other three of our servants were attacked, the last on the seventh day of our being shut up. These four had their huts together, and had been infected at the same time. Whoever has seen an Arab hut, could easily conceive this happening, even in typhus." Here none living separate from the first patient were seized.—*Holroyd*, p. 18.



relinquishing to them this portion of his duties. In an open and airy hospital the danger, from this cause, is so much diminished, as shewn by daily experience, as to induce us to think, that if the atmosphere of such a place could be constantly and perfectly renewed, the risk would be entirely removed under ordinary circumstances, and that the accessories of a confined and vitiated air are most to be dreaded.

It appears not a little strange, that many eminent men should have adopted the idea, that plague is more certainly communicable by *fomites*, than through any other means. The difficulty, in the matter of evidence already alluded to, exists here also, as in most of the reported instances of its communication in this manner, to which any degree of credit can be attached, personal intercourse had taken place with sick or infected persons. If the disease can be conveyed by merchandise, articles of dress, and even letters, allowing that the conditions necessary for its development rarely exist, still it is rather surprising that it has never been introduced into this country by the bales of cotton from Alexandria, which are presumed to be sufficiently disinfected when they are perforated in a few places, and stowed apart for a limited period, before they are dispersed in our crowded manufacturing districts. These bales are compressed to such a degree as not to be penetrable by water, are exported from Egypt at times when plague is most prevalent, and have often been packed and handled by infected persons; yet no one could seriously affirm, that the whole mass is purified by piercing it with two or three holes, while in many European lazzarettos, the bales are not opened at all. It is certain also, that for the last twenty-nine years, and probably for a much longer period, had records been kept, none of the fumigators of letters, handlers of baggage, nor washerwomen who receive and clean the dirty linen of persons performing quarantine at Malta, have been attacked by plague.<sup>a</sup> There are no properly authenticated facts as to the danger of wearing the

<sup>a</sup> Holroyd, p. 50.

clothes of pestiferous patients, where no personal intercourse has taken place, sufficient to furnish evidence to either party.<sup>a</sup> Considering the want of information on this point, no one can say, that under very peculiar circumstances *fomites* may not communicate the plague, but that they generally do so is highly improbable.<sup>b</sup>

After what has been said, it seems scarcely necessary to insist on the great influence of the aggregation of human beings in generating or spreading, or of their dispersion in destroying or checking plague. The congregation of people in towns and cities more than doubles the deaths from epidemics and other diseases. That fevers introduced into, or generated in the confined habitations of the poor, extend to the inmates of clean and airy houses, is so well known as to require no confirmation here. “ The registers shew this, they trace diseases from unhealthy to healthy quarters, and follow them from the centres of cities to the surrounding villages and remote

<sup>a</sup> Bowring on Oriental Plague, p. 33.

<sup>b</sup> The following is an extract from a letter with which the Count de Bertou had the kindness to favour me, in reply to some inquiries which I made on this subject; having heard him, when in France, allude to the circumstances in the course of conversation. It will be seen that even in this instance, there was a possibility of personal intercourse between the guardians of the lazaret, and the sick on board; especially when we consider the venality and carelessness of the subordinate Turkish officers. “ Au printems de 1837 il arriva a Beyrouth un batiment venant de Constantinople et ayant a bord quarante passagers tous pelerins se rendant a Jerusalem. . . Ce batiment comme tous ceux de la même provenance fut mis en quarantaine. Les passagers obtinrent de rester a bord, les marchandises furent déposées au Lazaret . . . la peste se déclara a bord . . l’équipage et les quarante pelerins (Hadji) perirent tous où a peu près tous mais aucun d’entre eux ne vint au Lazaret . . . On voulut purifier les marchandises et un gardien fut chargé d’ouvrir les balles dans lesquelles elles étaient renfermées . . . ce gardien fut attaqué de la Peste et mourut, un autre lui succéda et eut le même sort qui fut encore partagé par un troisième. Je puis vous garantir l’exactitude de ces détails car j’étais a Beyrouth quand ce que je viens de vous dire eut lieu. J’ai entendu et noté plusieurs autres circonstances qui prouvent d’une manière non moins évidente que la peste est une maladie contagieuse.”

dwellings.”<sup>a</sup> The connection between a crowded state of the inhabitants of a city, or the want of proper ventilation in the houses, and the rate of mortality, is shewn in the Smyrna plague of 1837, where the Turks, who inhabit an elevated and airy part of the town, lost 17 per cent., while the deaths among the Armenians, Greeks, and Europeans, who dwell in the low and confined quarter, amounted only to 6.3, 1.9, and 0.8 per cent. respectively; the apparent cause of this great difference being, that the houses of the Turks were crowded and unventilated, while those of the Christians were the reverse. Dr. Gregson allows, that the houses of the poor in Aléxandria are so constructed as not to admit of ventilation, and this is the case throughout the East; while it is certain that the different classes, such as Negroes, Arabs, Maltese, &c, suffer in proportion to the close and crowded state of their huts. It has been remarked that plague never exists to any extent in Constantinople, during a war, as all the idle and unoccupied of the lower orders are drawn off to supply the army. The cause of the great mortality in Eastern lazzarettos, is no doubt their close and crowded state, and the same explanation may be given of the examples which have been observed, of deaths taking place within a *cordon sanitaire*, while the troops forming it escaped. It would even appear, that the pestiferous miasm when confined, retains its virulence for a long period; as cases of plague are said to have occurred among the new inmates of a house, which had been shut up on account of the death of plague patients in it, when re-occupied a month or two afterwards, before ventilation had been practised;<sup>b</sup> but there is no evidence to shew that intercourse with the sick may not have been the cause.

With regard to the length of the period of incubation, or the time which elapses between association or contact with a pestiferous patient, and the manifestation of the disease, a point of such essential importance in respect of the quarantine laws,

<sup>a</sup> First Annual Report of the Register General of Births, Deaths, and Marriages, 1839, p. 116.

<sup>b</sup> See Mr. Abbott, in Bowring, p. 32.



our information is not so full as might be wished; but from the few facts collected, it would appear to be much shorter than it is generally assumed to be. It seems to be established by the Council of Health of Alexandria, that attacks occurring after the performance of *spoglio*,<sup>a</sup> never passed the term of five days from the seclusion and purification of the suspected individual. The *prodromi* of the disease never appeared above two or three days before its full development.<sup>b</sup> The surgeon of the "Surprise," whose case is related by Aubert, visited the lazaretto on the second, third, and fourth days before his departure, and was seized with plague on the second day after the vessel sailed. Of four criminals inoculated with matter from pestilential buboes, none passed the fifth day without being attacked. In Dr. Whyte's case, noticed by Sir J. M'Grigor, the time that elapsed between intercourse with the sick, and the seizure, was four days, and from the performance of inoculation, only three days and a half. In Mr. Dyson's case, the period was four days from exposure. Dr. Russell, in his History of the Plague at Aleppo, does not suppose the latent period to exceed nine or ten days. Mr. Abbott assigns fifteen days as the term; Dr. Gregson from five to seven; Dr. Pruner, a few hours "when contagious," and five days as a limit; Dr. Iken, three days.<sup>c</sup> Much of this is no doubt conjecture, but the long continued experience of the Levantines, in a matter of such consequence as their personal safety, has fixed the time necessary for the seclusion of those whom they engage as domestics, previous to their admission into a house, at ten days at the utmost; and from the other examples here cited, this period may with safety be fixed upon, as answering every desirable precaution, even under circumstances the most favourable for the propagation of the disease.

<sup>a</sup> The term *spoglio*, is used in the Levant to express the cleansing and seclusion of a person supposed to be infected, by the use of the bath, a clean dress, and confinement in a separate apartment.

<sup>b</sup> Aubert, de la Peste, p. 84.

<sup>c</sup> Holroyd on Quarantines.

The following may now be stated as the general conclusions, which seem to be warranted by the facts and considerations already noticed. 1st. If plague is ever regenerated in the manner in which it was originally produced, this only happens in certain localities, such as Lower Egypt, and even there but rarely. 2d. Its production and propagation essentially depend on the presence of vitiated animal *effluvia*, emanating, or which have recently emanated, from living bodies; in conjunction with a certain condition of the atmosphere, which favours the existence of epidemic diseases in general. 3d. When once formed or introduced, it is communicated to such healthy individuals as are constitutionally predisposed to its reception, by means of a specific miasm, generated in the bodies of the sick, and operating by absorption through the pulmonary surfaces. 4th. Association with the sick is sufficient for the communication of the disease, without the occurrence of personal contact; but there is no evidence to shew that it can be propagated by such contact, by *fomites*, or even by inoculation, where the pestiferous miasm has not been respired by the individual attacked. 5th. The frequency of plague in any country, and the extent of its ravages, bear a direct ratio to the crowded state of the population in the large towns, or of families in close and unventilated huts, and to the inferiority of the inhabitants in the scale of civilization. 6th. The interval between exposure to infection, and the development of the disease, does not appear to exceed five days, and is certainly less than ten, even under favourable circumstances.

If the above conclusions be correct, it is evident that any system of sanatory laws, based upon principles which lead, in some important points, to a belief exactly the reverse, must be at least very erroneous. This, however, is not all, for, allowing the principles on which the quarantine regulations are founded to be true, it can be shewn that the manner in which they are carried into effect is not only inconsistent with these principles, and contrary to humanity and common sense, but productive of the greatest hardship and injustice. If this

be true, to a certain extent, even of the quarantine establishments of European states, it is not easy to conceive the degree of cruelty, tyranny, and extortion, practised in the so called dens of misery in the East. That these assertions are not made without sufficient reason, nor unsupported by the authority of many able and well qualified judges, may be shewn by a short enumeration of the more prominent defects, contradictions, and abuses of the sanatory laws, and from the statements made by Dr. Bowring, Messrs. Holroyd and Thurburn, Clot Bey, Dr. Aubert, and many others. The first thing which must surprise every unprejudiced person, is the absurdity of obliging the crews and passengers of vessels arriving from any port in the Turkish dominions, the Black Sea, Greece, or the north-west coast of Africa, to undergo, at Malta, or elsewhere, a tedious imprisonment of at least twenty days; even although these vessels may have come without a single sick person on board, from a place where plague not only did not prevail at the time they sailed, but where it had been unknown for years. Again, suppose a merchantman and a sloop of war to leave Alexandria for England direct, on the same day, and with clean bills of health; and that the former should only reach the British coast after a voyage of six weeks, while the latter should arrive in twenty days, how would the case stand between the two? The time occupied on the voyage by vessels of war, and government packets, being included in the required period of quarantine, the crew of the sloop of war would be admitted to *pratique* on her arrival, without any further detention or trouble, while the unfortunate individuals on board the merchantman would have to perform a quarantine of at least twenty-one days, making, with the six weeks consumed in the passage, a total of nine weeks supposed to be necessary for their disinfection; a period bearing a proportion to that required for the same purpose, with regard to the crew of the sloop of war, as three to one. As it is universally assumed that plague is communicable by means of *fomites*, and that the period of incubation is of great or even unlimited length, varying, at least, from



twenty to sixty days ; most of the precautions adopted are designed for the prevention of danger from these chimerical causes, and hence articles of merchandise, wearing apparel, and goods of all kinds, have been carefully divided into two classes, viz., the susceptible and non-susceptible of infection, and treated accordingly. In the class of susceptible articles are comprised, along with a multitude of others, apparel of all kinds, artificial flowers, beads, bracelets or necklaces in strings, books, brushes, cotton and cotton articles, gold or silver on thread or other substances ; horn, linen, maps, paper, quills, silk, &c. &c. Most of these substances being either porous, or composed of animal matter, are said to retain the pestilential *virus* with great tenacity ; which *virus*, however, is supposed to be expelled, by a certain detention and imperfect exposure to the air, on board a merchant vessel, or in a lazaret ; while the clothes and bedding of the seamen in a ship of war, and the books, brushes, linen, maps, paper, and quills belonging to their officers, and the gold lace on their uniforms, are considered harmless without any such precaution. If, however, such articles as those above enumerated really retain and communicate the pestilential virus, it may well be asked what precautions can be sufficient to avert the danger, or how any place can escape it ? Has there ever been a single authenticated instance of the communication of plague in this manner, without the occurrence of personal intercourse with the sick ? The utter absurdity and mischievousness of the process used for the supposed disinfection of letters and papers, by cutting them to pieces, and smoking, bleaching, and defacing them, until they are frequently rendered illegible, or even by opening or destroying the seals, so as to expose both public and private correspondence to the eyes of Government spies or prying officials, are so glaring as to make it a matter of astonishment that such proceedings should continue to disgrace the administration of a civilized country. In noticing the various quarantine establishments, whether in Europe or elsewhere, any objections made against that at Malta must be understood as applicable to all others, in a tenfold degree,

as, from the good arrangement and excellent situation of the Maltese lazzeretto, it is far superior to any other place of the kind; but unnecessary confinement and expense are intolerable under any circumstances. The state of the Turkish, Greek, and Egyptian lazzerettos, and the extent of the abuses practised in them, defy all description; and can only be fully understood by those who have been unfortunate enough to experience them. Placed, generally, in the most unwholesome situations, low, damp, and either close and unventilated, or open to the weather; overrun with vermin, and encumbered with filth and ordure; they are, as experience has annually shewn, *foci* of the plague and malaria, and fatal to a great proportion of their doomed inmates.<sup>a</sup> Such lazzerettos as

<sup>a</sup> While travelling from Díyár Bekr to Constantinople, through Asia Minor, in the end of 1838, I found that plague had been raging at Sívás, and, on reaching a village about twenty miles to the south of that city, on the high road to Malatiah, where the Turkish forces were assembling under Háfiz Páshá, I learned that travellers, coming from Sívás, were obliged to undergo fumigation, in a machine like a close sentry-box, with a grated floor, under which fire was placed, with chips of fir and green juniper tops. I soon had an opportunity of seeing it in operation; a large caravan, with a number of loaded asses and mules, from all parts of the country, was stopped at the entrance of the village, and inquiry made, whether it contained any travellers from Sívás. One or two having been pointed out, they were placed in the fumigating box, until half suffocated, and then allowed to rejoin their companions, the caravan passing on. On arriving within a mile of Sívás, at the bridge over the Kizel Ermák, where there was another of these fumigating stations, I was desired to dismount and enter it, although coming from a place where no plague existed, to a city in which it was then prevalent. The fumigator then advanced, with a bunch of green juniper shoots in his hand, opened the door of the machine, and motioned me to enter; no sooner had I done so, than, disappointed in the offer of a bribe, he told me to come out again, as the appearance of compliance was all that he wanted; the fire was not even lighted. My guide and servant, with the horses and baggage, were taken no notice of. On reaching Sámson on the Black Sea, I found that, before any one received permission to embark for Constantinople, a quarantine of fifteen days was exacted. I and my attendant were, accordingly, consigned to the lazzeretto, which had been established some months before; a large empty granary, on the sea-beach, the lower part

have been established in Egypt or Turkey, appear to have been instituted either from an idea that they are necessary appendages to every government, or, as there is reason to believe has more than once been the case in Europe, in order to obstruct the commerce of a rival country, or as engines of state policy. There is little doubt, indeed, that many of the evils of the quarantine establishment at Malta would be remedied, were their continuance not necessary or expedient, for the satisfaction of the continental governments.

Nothing can be more ridiculous than the enforcement of quarantine in the case of foreign arrivals, at places where plague is actually raging; yet this is a constant occurrence in Turkey and Egypt. For instance, in 1838, there was a quarantine of fourteen days at Beirút, for ships of war, including the time spent on the voyage from Alexandria; and for merchantmen, of twenty-one days; while plague was extensively prevalent at the former place, and particularly in the lazaretto, where the said quarantine had to be performed. Again, while plague was common in Alexandria, vessels from

built of stone, and the upper of wood, open to the weather, (this being the month of December,) with a floor of wet mud, covered with filth and rubbish. Into this place, where the stench was intolerable, were crowded upwards of thirty individuals, Turks, Persians, Armenians, Greeks, and Jews, all in the same apartment; although some had arrived that very day, and others had nearly completed their term of imprisonment. We were prohibited from leaving the house, yet people from the town were allowed to visit us, sit, eat, and communicate with us in every way, and return again to their dwellings; while the attendants were constantly passing between the lazaretto and the market place, to purchase provisions, and other necessities for us. Several of those confined had been attacked with intermittent fever, with which I was at the time so ill that I considered myself perfectly justified, after a stay of three days, in making my escape, in a boat, from the beach, by means of a bribe, which, I believe, the superintendent of the lazaret, and the governor of the town, divided between them. In doing this, I committed no offence against the public safety, in regard to which, I should have been in the same state at the end of fifteen days, as at the end of three; while by remaining, I could only have endangered my life to no purpose.



Beïrút were liable to a quarantine of twenty-one days for ships of war, and twenty-five days for merchantmen ; but at the same time, a detention of only seven days was enforced at Beïrút, before permission was given to proceed inland.<sup>a</sup> As may be supposed, there is a great variety in the length of the period of quarantine at different places, and we consequently find it ranging from seven to forty days, or even more ; and, as a natural result, we see that what is considered sufficient purification for one place is not so for another. As has been already mentioned, the time at Beïrút was fourteen days for ships of war, with foul bills of health, including the voyage, and twenty-one days for merchantmen, counting from their arrival ; while, for persons proceeding to the interior of Syria only seven days quarantine was demanded. At Alexandria, it was twenty-one days for ships of war, and twenty-five days for merchant vessels. At Syra, the time is seventeen days with foul bills of health, and eleven days with clean bills, counting for merchantmen from the day of arrival, and for ships of war, including the voyage ; should a case of plague or cholera occur on the passage, then forty days quarantine must be performed on the island of Delos.<sup>b</sup> At Corfu, the quarantine for vessels from Egypt, Turkey, or infected ports, is the same whether with clean or foul bills, viz. twenty-five days ; yet vessels both from Syra and Corfu, or any part of the Greek dominions, or Ionian islands, arriving at Malta, although they have already performed a quarantine of seventeen days at the former, and twenty-five days at the latter place, have still to undergo another of eighteen days, and fourteen days, respectively. At Odessa the time of detention is fourteen days, with the use of chlorine fumigations, at Orsova ten days only, in Valachia fourteen days, with sulphur fumigations, and at Algiers seven days. Notwithstanding the questionable value of many of the quarantine regulations, their existence might be more patiently tolerated, were they main-

<sup>a</sup> Holroyd, pp. 4, 5, 6.

<sup>b</sup> Holroyd, p. 44.

tained with reasonable efficiency, or enforced with impartiality. At Malta there is but little reason for complaint on this head, although Mr. Holroyd gives an instance of partiality in the permission granted for the use of a boat in the quarantine harbour, for the children of Reshíd Páshá, which indulgence was denied to the other prisoners. On the occasion also of the introduction of small-pox into Malta, by a Greek boy from the Morea, landed at the lazaret from H. M. S. Asia, where he died, some of his clothes were sent to be washed at a neighbouring village, where the disease soon after broke out, and spread over the island, causing great mortality; it certainly shewed no great care or vigilance, that infected articles were allowed to be thus disposed of. In many lazarettoes, however, any attention to the regulations is, as has already been shewn, altogether dispensed with. At Alexandria, where the Council of Health consists of Europeans, the announcement of the appearance of plague was kept back for some time, in order that Clot Bey and Dr. Bowring, who were about to sail for Syria, might not be subjected to quarantine. The required detention of seven days at Beirút, before proceeding to Damascus, could be avoided by a *teskereh*, or government order; and the same pass-key, or a small sum of money, would open the doors of any lazaretto in Turkey or Egypt. It constantly happens also, that while there are quarantine posts at the maritime towns, and other places of importance on the principal high-roads, the greater part of the coast, and all bye-roads, are left wholly unguarded. The seclusion said to be practised by Franks in the Levant, exists, for the most part, only in name. Although the belief in the certain communicability of plague by contact, either mediate or direct, prevails universally among the Christian population, it must not be supposed that no intercourse takes place between those who are shut up, and the mass of inhabitants; for the male members of a family go about their affairs as usual, and satisfy themselves with keeping passers by at a certain distance from them, with a stick three or four feet in length, and if this

precaution be attended to, they do not scruple to associate with strangers.

With regard to the proper measures to be adopted, for preventing the introduction and spread of plague, it is evident that they must differ in different places, and that they must be modified, according as the country which they are designed to protect is insular or continental, thickly or thinly peopled, near to or far removed from the danger. The necessity for attending to these points is the greater, when we consider that the probability of the importation of plague from abroad is but a trifling subject of apprehension, when compared with the existence of the conditions requisite for its extension; for as these probably decide its mild or malignant character, and greater or less degree of prevalence, they are of infinitely greater importance than the actual germs of the disease. There is little reason to doubt, that a period of observation, not exceeding ten days, including the time spent on the voyage, or counting from the time of separation when any suspicious case has occurred, would be found amply sufficient for public safety, and that between this country and the ports of the Levant, the performance of any expurgation would be unnecessary, unless vessels make a quicker passage than hitherto. With proper care to prevent false reports, there is no reason why a merchant vessel should be subjected to a longer detention than a ship of war, at least the extra period now required may be very much shortened. The attempted purification of merchandize may be satisfactory to those who are near infected ports, but is probably of no real use whatever. Chlorine fumigations may be of service in confined apartments, or in the holds of vessels, in insuring ventilation to a certain extent, and in neutralizing putrid effluvia; but no benefit can be expected from perfumes, or the smoke of resinous and other substances, which, as well as chlorine and sulphurous acid gas, are very injurious to merchandize. Compared with attention to thorough ventilation and cleanliness, all other precautions are as nothing. The maintenance of a constant draught of air, by means of fires, has never been sufficiently



attended to, though of great importance. In those countries where plague frequently prevails, it is of the utmost consequence that the Councils of Health should be thoroughly efficient, in order that the disease may be discovered and counteracted on its first appearance, as its progress is often so slow as to be for some time unnoticed. Many disputes and much mischief having arisen, from the difficulty in recognizing it when it first breaks out, all medical men should be encouraged and enjoined to give immediate notice to the Council of any suspicious case; and if such case be at all of a doubtful character, or occurring at the season of the year, or under the conditions known to be favourable to plague, it ought to be considered as such, until the results are known. A single instance, however, of fever with bubo or carbuncle, should settle the question as to its nature. Plague undoubtedly has been, and can again be extinguished by prompt and decided measures, in small towns and other favourable situations; and even under the worst circumstances, its ravages may be much diminished, but the means of doing this are not the same in all countries. Throughout the East, and in the South of Europe, where the entire population is collected in towns and villages, and where the climate is such, that living in the open air, or in temporary huts and tents, is attended with little inconvenience; immediate evacuation of the houses, either wholly or in part, should be enforced; and the inhabitants dispersed over the country or in detached stations. Experience has shewn that this measure has constantly succeeded, when promptly employed, in checking the disease, both in military camps,<sup>a</sup> and in the villages of India, as seen in the plague of Márwár. In more northern climates, however, such a measure could only be occasionally and partially applicable, but the principle on which it is based, could be equally well car-

<sup>a</sup> In 1835, when plague appeared in an Egyptian regiment at Abú Zabel, removal to the desert, a few miles off, extinguished the disease. Bowring on Oriental Plague, p. 21.

ried out in another way. In all large cities, spacious and airy buildings, or receiving houses, should be constructed in such a manner as to afford merely a sufficient shelter from the weather, and insure thorough ventilation. Hospitals should also be erected to the number of at least three for every parish or district; one of which ought to be set aside for plague patients alone, another as an observation room for doubtful cases, and the third allotted for convalescents. On the appearance of plague, the sick should be immediately removed to the hospital, those who have associated with them to the hospital of observation, and the whole, or as many of the inhabitants of the infected quarter as possible, except those who inhabit large and airy houses, to the receiving rooms; and supplied with plain but wholesome food, for a period of ten days, unless any fresh cases should occur amongst them. In the mean time, the empty houses ought to be effectually cleaned and ventilated, and prepared for the return of their former inmates. So long as the houses are not completely evacuated, any purifications by chloride of lime and other such means, must be inefficient, from some of the individuals who remain having caught the disease, and who again spread it, before they are removed to the hospitals. It would be tedious to enter into all the details of such a sanitary system here, as various modifications of them would be necessary in different places, but the general principle must be obvious. In some large cities, barriers at the gates, or principal entrances, might be useful in carrying on the trade with the country, and receiving supplies of provisions. All persons of the higher classes who can go to the country, or send their families and attendants there, ought to do so. It is very questionable, whether, after the height of the disease, any general expurgation of cities can be carried into effect, so as to be immediately beneficial. Distribution of nourishment, draining, white-washing of houses, &c., are of secondary and doubtful use in producing any direct effect on the disease, segregation and perfect ventilation, being the only essentials on which dependance can be placed. The Board of Health of Cairo, ap-

pears to have confined its measures to paring off the surface of the principal streets, removing the sheds and pent houses over them, and prohibiting burials in the town.<sup>a</sup> This paring appears to have been formerly used in London, but such a practice appears more likely to occasion mischief than benefit, especially in Eastern countries, where exposure of the fresh surface of the soil to any extent is very noxious to health, and productive of intermittent and remittent fevers. In military cantonments, camps, and fortified places, the early establishment of *cordons sanitaires* and *lazzarettos*, in conjunction with the other preparations recommended above, is of great importance; in addition to which, the strict seclusion of infected corps and hospitals, frequent daily inspections, bathing, washing, or otherwise purifying clothes and bedding, and repeated changing of encamping grounds, the quarters of corps, and sites of hospitals, should be practised. In an extensive inland country, the attempt to exclude plague by a line of military posts is productive of much more mischief than benefit; while, if the same expense and care which this involves, were bestowed on local arrangements, for effectually meeting the disease on its appearance, the immediate results would not only be more satisfactory, but the condition of the people would be improved. In India, where the means of inland communication are so imperfect, the consequences of a really strict and efficient *cordon* would be the death of thousands by famine, and the infliction of every kind of misery.

Before any satisfactory system of sanitary laws can be universally established, the opinions of medical and scientific men, in the various European states, must approximate, in a much greater degree than they have hitherto done; but of this there is little chance, until governments turn their attention to the collection of statistical evidence on the subject of plague, on the most extensive scale, and in the minutest manner, in every locality where it is observed; instead of continuing to be guided in their legislation by popular belief and tradition. In

<sup>a</sup> See Dr. Pruner's Evidence, Holroyd, p. 27.



order to attain this most desirable end, a Council of Health ought to be established in every large city in the East ; composed of the consuls of the European powers, and the most respectable medical residents. Seeing the immense importance of an improved arrangement of quarantines to the trade of this country, and the necessity of facilitating the communication with our valuable and extensive possessions in the East, by every possible means, it would not only be highly honourable to a people who have ever stood forward in the cause of philanthropy and civilization, but it is incumbent on the government of an enterprising and powerful nation to take the lead in improving the sanatory laws, by inviting the attention of foreign states to the subject, and by proposing a general co-operation in carrying on the necessary inquiries.

THE END.















